

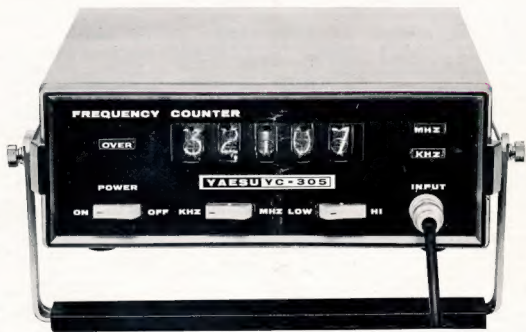
# amateur radio

Vol. 39, No. 12

DECEMBER, 1991

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# amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA. FOUNDED 1910



DECEMBER, 1971

Vol. 39, No. 12

## Publishers:

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Vic., 3002.

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10 a.m. to 3 p.m. only.

## Advertising Representatives:

TECHNICAL NEWS PUBLICATIONS  
87 Victoria Parade, Collingwood, Vic., 3068.  
Telephone 41-4962.  
P.O. Box 191, East Melbourne, Vic., 3002.

Advertisement material should be sent direct  
to the printers by the first of each month.

Names should be addressed to the Editor.

## Printers:

"RICHMOND CHRONICLE," Phone 42-2419.  
Shakespeare Street, Richmond, Vic., 3121.



All matters pertaining to "A.R." other than  
advertising and subscriptions, should be  
addressed to:

THE EDITOR,  
"AMATEUR RADIO,"  
P.O. BOX 36,  
EAST MELBOURNE, VIC., 3002.



ACKNOWLEDGMENTS: If you write to Federal  
Executive or to the Editor no acknowledgment  
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### COVER STORY

The Yaesu YC-305 Frequency Counter is the latest product from that  
world famous company to appear on the market. Five-digit display with  
eight-digit capability reading to 30 MHz., and operating from 117/234V  
AC or 12V DC, makes this a very versatile instrument. Further informa-  
tion from the Australian agent, Bail Electronic Services.

# "FOUR PEOPLE"

Christmas and the end of 1971 is now only a few weeks away.

I wish to look back at the year just past in one particular aspect, that is the role that has been played in our Federal affairs by four people. Each of these people have been members of the Federal Executive; each has in one way or another made a great contribution to the Federal organisation. It is only right that I should draw your attention to their work at the close of this year, as in each case the Executive has lost their services during 1971.

During this year Peter Williams, VK3IZ, resigned both as a member of the Federal Executive and as Federal Secretary. Peter first became a member of the Federal Executive in January 1965, and was Federal Secretary from Easter 1965 to his retirement, with a break of only one year, when he was Assistant Federal Secretary to John Battick.

Peter was, of course, the last honorary Federal Secretary. The role of the Federal Secretary is now undertaken by the Federal Manager. The Federal Secretary is a person that in the past has determined the effectiveness of the Federal Executive. As I pointed out so many times prior to the engagement of a paid Federal Manager, the work-load on the Federal Executive became in recent years, intolerable. A large part of this burden fell naturally upon the shoulders of the Federal Secretary.

Apart from long experience, Peter Williams brought to the job a real and lively interest in international affairs. He was one of those responsible for the Wireless Institute of Australia taking the initiative in inviting Amateur Societies in other countries to participate in the Inaugural Congress of the I.A.R.U. Region 3 Society in 1968. It was only natural that Peter would become the first Secretary of the Regional organisation. Peter has, of course, retained that role and whilst he has stepped down from the Execu-

tive he has retained his interest in the Wireless Institute as a member of the Victorian Division Council.

The second person to whom I wish to refer is Ken Pincott, VK3AFJ. Ken has been a member of the Publications Committee since 1954 and has been Editor of "Amateur Radio" for five years. He has been a member of the Federal Executive for three years and before that has, at various times, been a member of the Victorian Division Council and was President of the Victorian Division from mid 1965 to mid 1968. A little over a year ago, Ken indicated that he wished to resign as Editor of "Amateur Radio". He was persuaded to remain to allow the Institute time to employ a Manager who would undertake a significant part of the work associated with the production of the magazine and has remained until now both Editor and a member of the Federal Executive.

He has now finally resigned, both as Editor and as a member of the Executive. His service to the Institute has been recognised by the granting of an Honorary Life Membership which was presented to him at the Federal Convention in Brisbane at Easter this year. Ken, as Editor of "Amateur Radio," undertook an enormous work-load. He brought both experience and innovation to the magazine. During the period of his editorship I am sure most of the readers of the magazine will agree that it improved in all ways. As a member of the Executive, Ken contributed much with his long experience and critical approach.

Bill Roper, VK3ARZ, was a member of the Federal Executive for only 18 months. Bill, of course, had prior to this appointment, been a member of the Victorian Council, a member of the Publications Committee and at one time or another had undertaken virtually every job going within the Victorian Division. He was the Treasurer for the Federal Executive during a critical period. Without his assistance, I am

sure the Federal Executive would, on the financial side, have had considerable difficulties. It was Bill who set the pattern that the Manager has been able to continue. Bill was forced to resign during 1971 because of ill health. He remains interested in the Institute and I would not really be surprised if one day we were not able to lure him back to the Federal team.

We were all saddened by the passing of George Pither, VK3VX, on 2nd July, 1971. George had been a member of the Federal Executive since early in 1967. He had been particularly concerned with Intruder Watch and with I.T.U. representation. He had only become an Amateur following his retirement from the Royal Australian Air Force as an Air Commodore, and we were lucky that the Institute was one of his many interests. I have read so many sincere tributes to George that I find it hard, even after this lapse of time, to express the tremendous debt that the Institute owes to this man. George had his own particular brand of enthusiasm, it was quite infectious and coupled with his great experience, he was an invaluable member of the Federal team. The reality of his enthusiasm for Amateur Radio can perhaps be best demonstrated by the fact that he, accompanied by his wife, went to Tokyo for the Region 3 Conference at his own expense, using the conference as the centre point for a tour of South-East Asia only a few months before his death. I respected his judgment, admired his enthusiasm and valued his support.

I have called this Federal Comment "Four People". To each of them we all owe a lot. I draw your attention to their contribution, and for us all I say, simply, thank you.

—MICHAEL J. OWEN, VK3KI,  
Federal President, W.I.A.

Seasons Greetings and best wishes to you all for a Very Merry Christmas and a Happy and Prosperous New Year.

# VK3 SIX METRE CONVERTER

Developed by the VK3 SPECIAL PROJECTS GROUP

There have been many new developments in the type and diversity of semiconductor design and techniques since the development of the 6 Metre Converter by the VK3 V.h.f. Group in 1967. The committee responsible for the development of this updated model felt that Amateurs wishing to use the 6 metre band of 52-54 MHz. would appreciate a new kit being made available using some of the more modern techniques and semiconductors.

## DESIGN CONSIDERATIONS

The design parameters set down by the committee for this Converter were as follows:—

- (1) A low noise figure, consistent with the inherent atmospheric noise found on the 6 metre band.
- (2) Excellent cross modulation characteristics, particularly against adjacent television transmissions.
- (3) Sufficient conversion gain, to allow the converter to be used with tunable i.f. receivers which have wide differences in their input sensitivities.
- (4) The converter should have an untuned, impedance matching output stage.
- (5) The output frequency range should be from the broadcast band to 28 MHz.
- (6) The converter should use locally available components and cost less than \$25 to construct. This price should also include the price of the crystal.

Many discussions have taken place in this magazine on the subject of converter noise. In the articles on the design of the 2 metre and 70 cm. converters this topic has been dealt with in excellent form and this leaves very little to add. During the development of this converter it was felt that the lowest noise figure was desirable, however there is a limit below which reducing the converter noise figure would bring no real benefit. External noise at 6 metres is made up of man-made electrical noise (a real problem), atmospheric and cosmic noise. Although a quiet location may eliminate man-made electrical interference, the atmospheric and cosmic components are still present. These combined are generally considered to average out at about 4 dB. at 52 MHz.

Without becoming involved in a discussion on noise measuring techniques it was decided to measure the noise and gain figures of this converter by the same method used on the VK3 V.h.f. Group's 144 and 432 MHz. Converters. The equipment used for these determinations was a Rhode and Swartz Frsophometer.

If the basic circuit is examined it can be estimated where noise will be generated. The bandpass r.f. filter has

an insertion loss of 0.5 dB. and the i.f. amplifier stage (Q3) a noise figure of 2 dB. The conversion loss of the balanced mixer has been shown to be close to 7 dB. The combined total of these figures would give such a converter an effective noise figure of 9.5 dB. By including a low noise pre-amplifier ahead of the mixer circuit, the noise figure of the converter can be reduced to that of the amplifier by ensuring that this pre-amplifier stage has a gain of at least 10 dB. above the figure previously calculated. The device finally selected was the Motorola MPF121. This MOSFET gives in an unneutralized configuration 25 dB. of gain, which is slightly more than required. Because a balance between gain and cross modulation must be reached, r.f. amplifier gains much higher than this are undesirable.

The input sensitivities and related signal-to-noise ratios of modern communication receivers are of such a nature that only moderate conversion gain is necessary to produce very good results from a converter. However, many types of receivers, some of which come from disposal sources, require a higher conversion gain to produce optimum performance. The conversion gain of this converter may be varied by inserting the required value of resistance in the source of the i.f. amplifier. The value of this resistance R9 and the conversion gain obtained with an i.f. output at 8 MHz. is shown in Fig. 5. Slight differences in conversion gain to that shown in Fig. 5 will result at different i.f. frequencies with the tendency of the gain to decrease as the output frequency increases.

## DESCRIPTION

The circuit diagram is shown in Fig. 1. The converter has been designed round a double balanced hot-carrier diode mixer. Hot-carrier diodes make high frequency mixing in this type of circuit possible and although diodes may be used it was felt that the extra cost of the HP-2800 diodes were justified when the results of the converter were assessed.

The balanced mixer transformers use ferrite toroids. The windings are close coupled and when used in conjunction with the hot-carrier diodes may be used at frequencies in excess of 200 MHz.

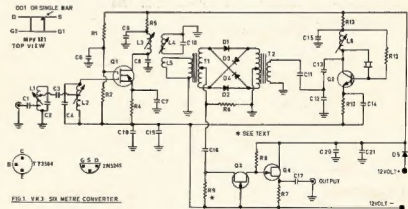
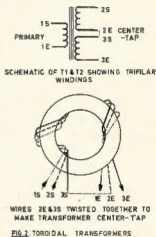


FIG. 1. VK3 6m METRE CONVERTER.

- C1, C6, C7, C9, C14, C15, C16, C19, C21—0.001 uF. R1—82K ohm.  
C2, C4, C13—15 pF. R2, R12—100K ohm.  
C3—3.3 pF. R3, R9—220 ohm.  
C8—27 pF. R5, R13—100 ohm.  
C10—22 pF. R6—1K ohm.  
C11—68 pF. R7—2.2K ohm.  
C12—150 pF. R8—6.8K ohm.  
C17—0.0047 uF. R10—1.5K ohm.  
C18, C20—0.047 uF. R3, R11—not used.  
C5—not used. C2—TT3554 or 2N5554.  
Q1—MPF121 or similar.  
Q2, Q3—HP2800 hot-carrier diodes.  
Q4—2N5246/7T554 or similar.  
Q5, Q6—2N5246/7T554 or similar.

Single tuned front-end:

C2, C3—not used. C4 changes to 5.8 pF.

\* C/o. 478 Victoria Parade, East Melbourne, Vic., 3002.



# SIDEBAND ELECTRONICS ENGINEERING

After selling my entire stock of YAESU MUSEN Transceivers, imported under by-law privileges at reduced import rates, which cannot possibly be repeated in the future, I have had to disappoint a large number of Amateurs who for one reason or another missed out. Meanwhile the Japanese Yen currency has increased in value, now already 7% with respect to the Australian Dollar and consequently future imports will cost even more than they were before last June or from other sources.

In order to help those unfortunate Amateurs I am willing and prepared to import another limited quantity of YAESU MUSEN Transceivers, paying the full import duties at the higher cost, but selling them strictly at **cost price**. Under the present monetary situation, and therefore with restriction, those prices will be:—

<b>YAESU MUSEN FT-101 Transceivers, AC/DC solid state</b> .....	<b>\$640</b>
<b>FT-200 Transceivers, with AC supply/speaker unit</b> .....	<b>\$400</b>
<b>FT-DX-560 AC Transceivers, equivalent to the FT-DX-400</b> ..	<b>\$540</b>
<b>FT-DX-401 AC Transceivers, the latest models with CW filter, final amplifier fan and noise blanker</b> .....	<b>\$600</b>

But remember, these are actual cost prices, no profit on them and only a special service for those who came too late in the past and for a limited quantity only, so don't delay to get that Christmas present! If the Yen goes up further in value, naturally these prices will increase automatically in the same ratio.

## OTHER GOODIES, STILL IN STOCK:

### MIDLAND PRODUCTS

One Watt Transceivers, 27 or 28 MHz. operation .....	<b>\$37.50</b>
Crystals for 27.065, 27.085, 27.240, 27.880, 28.100, 28.200, 28.300, 28.400, 28.500 operation, per Pair .....	<b>\$3</b>
12 Volt re-chargeable nickel-cadmium Batteries .....	<b>\$10</b>
AC Chargers for nickel-cadmium Batteries .....	<b>\$10</b>
SWR METERS, with two 100 micro-amp. Meters, reads forward and reflected power simultaneously .....	<b>\$20</b>
SWR METERS, single meter, standard type .....	<b>\$12</b>
<b>DYNAMIC MICROPHONES:</b>	
PTT mobile hand-held type, metal case .....	<b>\$10</b>
PTT table type .....	<b>\$15</b>
PTT table model with 0-60 dB. built-in two-stage pre-amplifier .....	<b>\$25</b>
HEADPHONES, light-weight, excellent quality, 8 ohm impedance .....	<b>\$6</b>
TRANSCEIVERS, 240V AC, 5 watt type, 27 to 28 MHz., xtal controlled with six sets of crystals, still only .....	<b>\$100</b>

HY-GAIN TH8DX Tri-band Master Beam .....	<b>\$220</b>
HY-GAIN 18AVT, new, 10 to 80 mx Vertical, due to arrive soon .....	<b>\$80</b>
MOSLEY TA33JR Junior Tri-band Beam .....	<b>\$105</b>
MOSLEY MUSTANG Tri-band Beam, the high-power version of the TA33JR .....	<b>\$130</b>
KATSUMI ELECTRONIC KEYERS, Model EK-26, reduced to .....	<b>\$50</b>
EIMAC 3-500-Z Linear Amplifier Tubes .....	<b>\$37.50</b>
CETRON 572B/160TL Linear Amplifier Tubes, per Pair .....	<b>\$45</b>
CRYSTALS, FT-241 type, 400-500 KHz., per box of 80 crystals, clearance sale .....	<b>\$10</b>
GALAXY V. VOX Units .....	<b>\$25</b>

### USED EQUIPMENT

YAESU FT-DX-400 Transceiver, as new, demo. set ..	<b>\$400</b>
HEATH Maurauder 10-80 mx SSB, etc., tx AC operated	<b>\$125</b>
HEATH HR-20 10-80 mx Amateur Band Receiver, needs external AC supply .....	<b>\$60</b>
BC-348-Q and BC-348-R Receivers, clean units .....	<b>\$50</b>
COLLINS KWM-2 Transceiver, with clip-on AC supply-speaker unit .....	<b>\$700</b>

All prices quoted are strictly net, cash with order, sales tax included in all cases, subject to alteration without prior notice.

# SIDEBAND ELECTRONICS ENGINEERING

P.O. BOX 23, SPRINGWOOD, N.S.W., 2777

Proprietor: ARIE BLES

Telephone, note the new number: Springwood (STD 047) 511-636

The method of winding these transformers is shown in Fig. 2 and provided the drawings are followed it is easy to make an acceptable double balanced mixer. Due to the small size of the ferrite toroids, it is possible to build the complete mixer within the area of a double Neosid can. Not only does this give good isolation, but of greater importance, reduces local oscillator radiation from the converter.

A double tuned bandpass filter is used in the front end, however this is not a mandatory requirement. The input coil L1 can be omitted if required and the input tap from the aerial made on L2. The i.f. amplifier uses the MPF121 MOSFET. Unlike devices as the 3N140, the makers have built into the silicon chip small diode elements which protect the insulated gates and allow the device to be handled in a similar manner to JFETs and bipolar transistors. The output of the pre-amplifier passes into a further tuned pair of L3 and L4. Due to the low input impedance of the balanced mixer, a link L3 over the hot end of L4 is used.

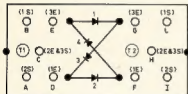
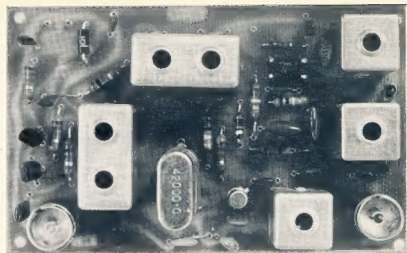


Fig. 3. BALANCED MIXER LAYOUT

A source follower output stage is used to match into the front ends of tunable receivers. The input impedance of this stage is high and to match this to the low impedance output of the mixer a grounded gate i.f. amplifier is used. The gain of this stage can be varied by the selection of a suitable resistor R9 from the graph in Fig. 5.

The oscillator uses a third overtone crystal and injection into the mixer



at the correct impedance is via the capacitive dividing network of C12 and C13.

The converter has been designed with both the positive and negative supply rails isolated from earth. Diode protection has been included in the positive supply rail. The diode will protect the semiconductors against a reversed voltage supply, but will not serve any purpose against transistors incorrectly mounted in the board.

A supply voltage of 11-15 volts at 15-20 mA d.c. is required. The design voltage was 12.6v. The converter is constructed on an epoxy fibre glass board 4 1/2" x 2 1/2". All capacitors below 200 pF are NPO disc ceramic. Above this value, ceramic or polyester capacitors can be used. Resistors must be of small physical dimensions and ratings up to 1/4 watt are suitable. The coil formers used are Neosid type A (single assembly) and type B (double assembly), both with screening cans. F22 v.h.f. tuning slugs are used throughout.

## PERFORMANCE

All prototypes measured had noise figures of better than 3.5 dB. The conversion gain is adjustable from 25 dB to 60 dB. One unit was measured at 32.5 MHz. with an i.f. output of 8 MHz. at a maximum of 68 dB.

When using the double tuned front end with all coils peaked on 52.5 MHz., a -3 dB. bandwidth of 250 KHz. was obtained. By stagger tuning each of the bandpass pairs 250 KHz. either side of the centre frequency, a -3 dB. bandwidth of 750 KHz. was obtained. L1 and L3 were adjusted to the higher side and L2 and L4 to the lower side. Eliminating L1 and peaking all coils on 52.5 MHz., a -3 dB. bandwidth of 460 KHz. was obtained. The stagger tuning of L2, L3 and L4 resulted in a bandpass in excess of 1 MHz.

No measurements of cross modulation have been performed. However, qualitative on-air tests have shown that the converter exhibits excellent characteristics.

## CONSTRUCTION

Full constructional details will be supplied with the kits which will be available early in December. For those not wishing to obtain a kit, a few hints may be useful.

First wind the balanced mixer transformers. This is done by taking three by two-foot lengths of 30 gauge B. & S. enamelled wire and carefully twisting them together until five turns per inch is reached. Cut this twisted length in half, one piece for each of the transformers. Wind twelve turns onto each toroid and label the ends as shown in Fig. 2. If a printed circuit board is not being used, the two transformers and four diodes can be mounted on a Neosid type B base and the appropriate wires soldered to the pins. The unit can then be covered with a type B aluminium can.

The remaining components can be mounted in any order. However, we have found it expedient to mount the coil formers and wind the coils as the next step. Although no special pre-

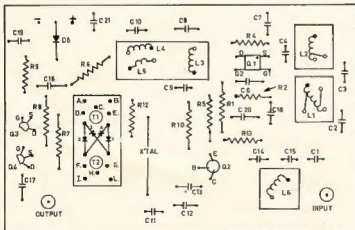


Fig. 4. BOARD LAYOUT

cautions are necessary for handling the semiconductors, they should be pushed down to  $\frac{1}{8}$ " from the board.

#### ALIGNMENT

With the supply voltage connected, tune the oscillator coil L6 for maximum voltage drop across R10. The 5-volt range of a multimeter will be suitable. Switch the supply voltage off and on a number of times to ensure that the oscillator starts reliably each time.

Wind all v.h.f. slugs fully in and then apply a suitable signal to the converter. If a signal generator is not available, an oscillator can be built using the transmitter crystal. A suitable circuit was published in an excellent article written by R. Higginbotham in "Amateur Radio," December 1970, page 9.

Tune L3 until a signal is heard in the receiver. The remaining coils can now be tuned, starting with L4 and working towards the aerial coil L1. As each coil approaches resonance a slight amount of interaction may be noticed. Reduce the signal strength and re-peak each coil, starting at L3 again until maximum sensitivity over the desired bandpass is achieved.

If required, the converter gain can now be adjusted. A number of Amateurs have found it a good rule of thumb to increase the gain until the aerial noise produces a 1-2 dB. reading on the signal strength meter, but others increase the gain until a small amount of aerial noise is just heard. However, as this is a matter of choice, it is best left to the Amateur to satisfy his own individual requirements.

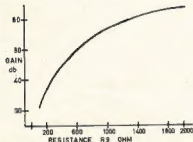


FIG. 5 CONVERTER GAIN

#### COIL DATA

##### General:

- L3—9½ turns 24 B. & S. wire, close wound.
- L4—3 turns 24 B. & S. wire, close wound.
- L5—2 turns 24 B. & S. wire, close wound, close coupled to L4.

##### Double tuned front-end:

- L1—11 turns 24 B. & S. close wound, aerial input at 3 turns from earth end, output to C3 at 8½ turns from earth end.
- L2—10½ turns 24 B. & S. close wound, input from C3 at 8 turns from earth end.

##### Single tuned front-end:

- L1—not used.
- L2—10½ turns 24 B. & S. close wound, input from C1 at 3 turns from earth end.

#### Oscillator Coil, L6:

Close wound with 24 B. & S. wire.

Freq. of Crystal	No. of Turns
48-52 MHz.	10
42-48 "	12
38-42 "	15
34-38 "	18
30-32 "	23

#### AVAILABILITY

A limited number of these kits will be made available through the Disposals outlet of the VK3 Division. The kit contains all capacitors, resistors, semiconductors, coil formers, ferrites and wire. The builder will need to supply his own crystal at the third overtone frequency. Those made by Hy-Q Electronics (specification number HS291) are suitable. The price of the kit is \$15.50 including normal postage and can be obtained by writing to either—

**W.I.A. Disposals**  
(Victorian Division),  
P.O. Box 65,  
Mount Waverley,  
Victoria, 3150,

or to the Divisional office—

**6 Metre Converter,**  
W.I.A. Vic. Division,  
P.O. Box 36,  
East Melbourne,  
Victoria, 3002.

#### NEW MULTIMETER



Radio Parts in Melbourne have introduced a versatile multimeter that will find many applications for use in laboratories and servicing operations. Designated "Rapar" Model F-75K, this tester offers 30,000 ohms per volt d.c. and 16,000 ohms per volt a.c., and is fitted with a burn-out proof device. Other features include a wide range of voltage and resistance measurements, current and decibel measurements, and an in-built signal injector for checking audio or radio circuits.

Further technical data is available from Radio Parts Group, 96/ Spencer St., West Melbourne, Vic., 3003, or Tel. 328-7038.

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# Regulated Power Supply for Transistor and Integrated Circuit Projects

D. J. McWILLIAM,\* VK4ZDJ

The following circuit for a low voltage power supply should be of interest to those who require an inexpensive, but well-regulated variable supply for use with transistor and integrated circuit projects.

The supply is based on the National Semiconductor 5 volt regulator integrated circuit LM309K. This unit is mounted in a TO-3 package and has an output rating of 1 ampere. A TO-5 package is available but the rated maximum output is only 200 mA. provided adequate heat sinking is used.

From the manufacturer's data sheet: "The regulator is essentially blow-out proof. Current limiting is included to limit the peak output current to a safe value. In addition, thermal shutdown is provided to keep the IC from overheating. If internal dissipation is too great, the regulator switches on and off with a duty cycle that prevents excessive heating."



from one supply to the other by a two-pole, two-position switch located at the centre of the front panel.

In series with one of the supplies is a current meter which may be switched to give either 0-100 mA, or 0-1 A. f.s.d. The resistor, R2, is made from a short length of resistance wire such that its value is approximately one-ninth of the internal resistance of the current meter. This can be very easily achieved experimentally.

The data sheets for the LM309K state that for a variation of 7v. to 25v. input, the line regulation is typically 4 mV. and that the load regulation is typically 30 mV. over the current range 0 to 500 mA. The maximum input voltage is 35 volts. Measurements on the constructed supply operating at 10 volts and 20 mA. current showed that the residual ripple voltage at the output was below 1 mV.

Should constructors wish to have a different voltage output range, then the 1.0K ohm resistor (R1) should be replaced with one of the values given in Table 1.

Output Range	DC Input Voltage	R1
5 to 20 V.	>23 V.	500 $\Omega$
5 to 25 V.	>28 V.	330 $\Omega$
5 to 30 V.	>32 V.*	250 $\Omega$

Table 1.

\* Note: Maximum input voltage 35 V.

The LM309 is a very complex unit comprising a total of nineteen transistors and fifteen resistors. The device does not use a zener diode for the internal reference. Instead, the reference is developed from the highly-predictable emitter-base voltage of the transistors.

The choice of this device gives all the features available in expensive supplies and only necessitates a few external components.

The circuit described is a dual supply designed for IC projects, but a single supply would be adequate for the majority of transistor projects.

The power supply is assembled in an amplifier cabinet measuring 8 1/2" wide x 4 1/2" high x 6 1/2" deep. This cabinet is readily available from Radio Parts, Melbourne (Type AC3). The two power transformers used have a multi-tapped secondary winding rated at 2 amperes and are available from A and R Transformers (Serial No. 6978). The diodes used are 1 amp. 50 p.i.v. types, available from most suppliers.

The two regulators are mounted on a standard heat sink which is mounted vertically at the rear of the cabinet. All the other components, with the exception of potentiometers and switches are located on a printed circuit board mounted vertically in the cabinet, immediately behind the two meters.

A 0-15 volt, 2" x 2" meter is located on the front panel and is switchable

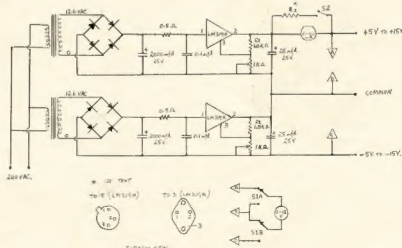
## TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R." in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Manuscripts should preferably be typewritten but if handwritten please double space the writing. If possible collaborate with any local draughtsman, student or engineer to do illustrations after the method shown in "A.R." May 1971, page 5. Otherwise drawings will be done by "A.R." staff.

Please address all articles to:

EDITOR "A.R."  
P.O. BOX 36,  
EAST MELBOURNE,  
VICTORIA, 3002



Basic Circuit for the Regulated Supply

\* 87 Parkside Flats, Railway Avenue, Mt. Isa, Qld., 4825.

# Hy-Q Electronics

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## OSCILLATOR KITS FOR THE AMATEUR

### OSCILLATORS

Hy-Q Electronics have introduced a range of oscillator kits for the serious Amateur and Professional man.

Types QO-1 and QO-2 are supplied as kits containing the components required for the construction of a frequency source of good accuracy. A crystal is not supplied as part of the kit and should be ordered separately.

The oscillators cover the frequency ranges of 3 to 20 MHz. and 20 to 60 MHz. The QO-1 is a fundamental mode oscillator and the QO-2 operates in the third overtone mode.

The oscillators employ a broadly tuned circuit providing crystal controlled operation over the specified frequency ranges.

Power output is 1 milliwatt and is adequate for a wide variety of applications.

#### Specifications:

Frequency range: QO1 3 to 20 MHz.  
QO2 20 to 60 MHz.

R.F. output: Minimum of 200 millivolts RMS across 50 ohms.

Power requirements: 6 volts DC at 20 mA. maximum. The oscillators will operate satisfactorily over the range 4 to 9v.

Operating temperature range: 0° to 60°C.

Dimensions: 1 1/4 x 1 1/4 x 1 1/4 inches (38 x 38 x 38 mm.).

Mounting: Four 1/8 inch (3.1 mm.) holes on 1 1/4 inch (32 mm.) centres. Tubular spacers are supplied for above chassis mounting. Alternatively the oscillators may be mounted over a cut-out 1 1/4 in. (32 mm.) square with 3/8 in. (8 mm.) radius corners.

### FREQUENCY MARKER

The type QO-3 is a frequency marker intended for use as a convenient source of reference signals at 1,000, 500, 100 and 25 kHz. with accuracy adequate for many experimental requirements. The signals are available singly or simultaneously, depending on the use of the optional selector switch.

The output at each frequency is of the order of 1 volt peak-to-peak and is of such a waveform as to provide harmonics of adequate amplitude for ready detection up to approximately 30 MHz.

The QO-3 marker is normally supplied in kit form with all of the components including the crystal required to assemble the unit on a single printed circuit board, the optional selector switch is connected to the board by short flexible leads.

#### Specifications:

Output frequencies: 1 MHz., 500, 100, 25 kHz.  
Accuracy: Adjustable against external standard or standard frequency transmission to within 1 ppm.

Stability: Typically over 8-hour period and plus or minus 2% supply voltage change, within 3 ppm.

Output voltage: At each frequency approximately 1 volt peak-to-peak.

Output waveform: Distorted pulse with harmonics to 30 MHz.

Power requirements: 9 volts DC plus or minus 5% at maximum of 25 mA. Other voltages with plus or minus 5% stability by change of resistor.

Mounting hole dimensions: Four 0.125 in. (3.1 mm.) holes on 1.75 in. x 2.75 in. (44.5 x 69.9 mm.) centres. If mounted on chassis without spacers, a 1.75 in. x 2.75 in. (44.5 x 69.9 mm.) cut-out with a 0.3125 in. (8 mm.) radius corners is required.

## ON WITH THE SHOW

Up in North Queensland the active Amateur fraternity are members of the Townsville Amateur Radio Club. It is a strong club that believes in actively involving its members in interesting projects and not surprisingly these projects seem to reflect the Amateur's community spirit. For far too long, the North has been regarded by the rest of Australia as a sleepy hollow that grows a few coconut palms. Yes, we do rig antennas on coconut palms, and yes we do have a good sleep after the R.D. Contest, but there the similarity ends.

Queensland has more cities of 40,000 population and over than has any other State, and Townsville (population 72,000) is regarded as the Capital City of North Queensland. Thus it is important that the Townsville Amateur Radio Club should not just accept affiliation with the W.I.A. Queensland Division, but that it should be able to hold its own with the Capital City Clubs. Indeed, club members have won every section in the Annual State VHF/HF Contest for the past three years.

As part of the most recent club project, VK4TC, the club station, was taken to the annual Townsville Show. The objects of the display at the Showground were: (1) To recruit starters for the club's current A.O.C.P. classes, (2) To put the club's activities before the public, and (3) as a technical exercise for club members.

And what a technical exercise it was! Because Showgrounds are, electrically speaking, very noisy areas the committee organising the operation of VK4TC decided that the station should

transmit from the site but a remote receiver should be set up in a quiet location and that received signals should be linked into the Showgrounds via an FM carrier. In addition, a 53.032 MHz two-way link was provided as liaison frequency between the transmitting and receiving stations.

Mount St. John, five miles line of sight west of the Showgrounds was chosen as the receiving site. Here the proverbial antenna farm was installed, all co-ax cables feeding a Trio TS510D HF Transceiver. The transceiver audio output was fed electrically to a homebrew ten watt 146 MHz FM transmitter. A 10 watt 53.032 transceiver and a TV set were also provided for the remote site operator.

At the show, the duty operator monitored his transmission frequency via the 146 MHz FM link receiver. Instructions to change frequency were



Bill Sebbens VK4XZ talking to the Showgrounds on 53.032 MHz AM liaison frequency. The TS510D was used as the main HF receiver at Mt. St. John.

sent on the 53 MHz, liaison channel. An FT-200 tx feeding a TA33JR beam was used on HF from the Showgrounds. As a new country was contacted, it was marked on a large map behind the station operator.

Of course there are always eventualities that no committee can really foresee. This display was no exception in this regard. Half way through the show, the local Civil Defence Group decided to fire up their emergency SSB transceivers operating just above 3700 KHz. As their equipment was located next to the T.A.R.C. display, their 80 metre transmissions were blocking our receiver and vice versa.

In true Amateur style, improvisation was immediately necessary. The operator at the Showgrounds fed audio down the 6 metre link to Mt. St. John where he was relayed on HF via the Trio TS510D. The received signal was then linked back to the show via 2 metres FM. In fact, the system was further simplified when the remote station operator put the TS510 into VOX operation. The Showground operator was then able to call and listen automatically.

This year's display was eminently successful because it involved most members of the Radio Club and equally importantly, many of the general public. Perhaps your club can help fly the Amateur Radio flag and get "on with the show". It's certainly a very worthwhile effort.

Story and Pictures by Peter J. Lindsay, VK4QD T.



Peter Barton VK4PV manned the FT200 at the Showgrounds. The 146 MHz receiver at the left was used to drive a large monitor speaker. The map in the background shows countries worked from the site.



Bob Grumet, VK4ZRG (left), and Bill Sebbens VK4XZ, installing the 146 MHz FM link antenna at Mt. St. John. This picture is of interest to those who have had poor results when trying to photograph antennas. This shot was taken at 10.30 a.m. using Kodak 32 A.S.A. Panatomic X film and an electronic flash. The camera was fitted with a 3-stop red filter which has had a startling effect on the blue sky.

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A VERY MERRY CHRISTMAS AND PROSPEROUS NEW YEAR

## FILTER TYPE S.S.B. TRANSMITTER

C. RENTON,\* VK4CR

Being a comparative beginner in s.s.b., the writer desires to cater for beginners by submitting the following step by step explanation of what happens in such a transmitter, using the block diagram to illustrate the steps.

Radio frequency oscillations are generated in the carrier oscillator, this fixed frequency being governed by the frequency to which the carrier crystal has been ground or etched, or perhaps lowered slightly in frequency by rubbing soft solder on one or both faces.

The 3-30 pF. trimmer across the carrier crystal permits a very slight adjustment of the carrier frequency.

As an example, let us say the carrier crystal is at 4994.2 KHz.

\* 16 Wilson Street, Bonyal, Qld., 4304

This r.f. signal, called the **carrier**, is fed into the **balanced modulator** which consists of two small diodes, a 1K potentiometer and a bifilar wound coupling coil, the latter being wound around the carrier oscillator coil.

In the meantime a very low frequency signal is being introduced by the operator's voice, per the microphone, to the first audio stage and amplified in an audio amplifier stage.

From the latter it travels to the balanced modulator as arrowed in the diagram.

It will thus be seen that two signals are now meeting in the balanced modulator, the high frequency carrier signal and the very low frequency audio signal.

To make matters a little clearer, we will assume that the frequency of a single tone of, say, 1,000 Hz. (1 KHz.)

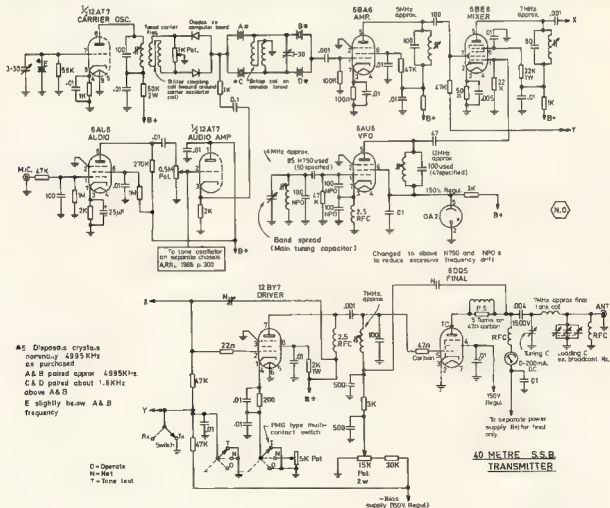
is the audio signal instead of the varying frequencies of the human voice.

The carrier signal, assumed as above as being 4994.2 KHz., mixes with the 1 KHz. audio signal to produce two new frequencies by addition and subtraction respectively, thus  $4994.2 + 1 = 4995.2$  KHz. and  $4994.2 - 1 = 4993.2$  KHz.

These new frequencies are called upper and lower sidebands respectively of the original 4804.2 KHz. carrier and **both** of these sidebands proceed to the next stage

However, the balanced modulator has a further important duty, i.e. it must prevent the original carrier frequency itself from accompanying the sidebands on their way.

The next stage is the sideband filter, comprising mainly in our case four crystals, two being etched to a slightly



higher frequency than that of the carrier crystal and the remaining two to about 1.8 KHz. higher still. For our example, say two at 4995 KHz. and two at 4996.8 KHz.

(To be a little more technical, the carrier crystal should be located frequencywise about 20 dB. down the lower slope or skirt of the sideband filter passband curve. A second carrier crystal could be similarly placed on the upper skirt.)

Two other components of the sideband filter are a bifilar wound coil on an annular toroidal core and a 3-30 pF trimmer, these being tuned to an intermediate position between the crystals.

The sideband filter will close the gate against one of the two sidebands, so that only a single sideband (s.s.b.) will pass on to the amplifier stage.

In our example the 4995.2 KHz. signal will be blocked and the 4995.2 KHz. signal passed.

The s.s.b. signal of 4995.2 KHz. now passes to the 6BA8 amplifier and thence to the 6BE8 mixer, where it will mix with an independently generated signal which issues from the variable frequency oscillator (or v.f.o.) to obtain the signal frequency which it is desired to transmit in one of the Amateur bands.

We will suppose it is desired to have a QSO at 7050 KHz. in the 40-metre band. The v.f.o. must generate a signal tuned to such a frequency as will produce 7050 KHz. when mixed with the above-mentioned 4995.2 KHz. signal.

By addition,  $7050 + 4995.2 = 12045.2$  KHz. So that, if the v.f.o. is tuned to have an output frequency of 12045.2 KHz., which latter is fed into one grid of the mixer valve, whilst the 4995.2

KHz. signal is injected into another grid of the same valve, a 7050 KHz. output will be obtained from the mixer.

Thus  $12045.2 - 4995.2 = 7050$  KHz. (The mixer will also produce another output by addition of 12045.2 and 4995.2 but this signal will be tuned out.)

The 7050 KHz. s.s.b. signal will now be amplified in the 12BY7 driver stage, which in turn passes this signal to the 6DQ5 final power amplifier where the s.s.b. signal is strengthened sufficiently to be fed via a pi coupler to the antenna.

Reverting to the v.f.o., in my case, for the 40 metre transmitter, the input to the v.f.o. valve was set at one-third of the frequency of the v.f.o. output, so that for the above example, the v.f.o. input would be tuned by means of the bandspread variable capacitor to  $12045.2 \div 3 = 4015.06$  KHz.

Both condensers of the pi coupler require to be carefully manipulated to dip the final to resonance coincident with the lighting of a suitable dummy antenna lamp in the first instance (I used a 75w. 240v. lamp), with a further check when the antenna lead-in cable is connected.

I find a small pea lamp inserted in series with the antenna lead gives a good indication of whether the final is tuned correctly. One can adjust to have a very good swing of the final current meter on voice and yet not light the pea lamp.

I have altered the above home-brew to suit the 20 metre band and by choosing 14100 KHz. output to set up coil frequencies, the v.f.o. input frequency in this case being set to one half of the v.f.o. output. I arrived at

the following frequencies to which to wind and set the coils.

14100 KHz. for mixer, driver and final frequencies.  
Minus 4996 KHz. approx. s.s.b. from driver.  
- 9104 KHz. v.f.o. output frequency required,  
and  $9104 \div 2 = 4552$  KHz. required input to v.f.o. valve.

## NATIONAL POLICY FOR SCIENTIFIC AND TECHNOLOGICAL INFORMATION SERVICES

Every nation needs an efficient system for the storage, retrieval and dissemination of information in science and technology if it is to take its place in the community of technically advanced countries. A new look at Australia's information needs in the fields of science and technology is now under way.

A Committee of Enquiry, with a wide-ranging membership chosen from industry, universities and colleges, C.S.I.R.O. government and libraries was recently announced by Sir Alan Hulme, Minister for the Department of the Vice-President of the Executive Council. The Scientific and Technological Information Services Enquiry Committee, under the sponsorship of the National Library, is supported by a working Secretariat of four.

The committee will examine the needs of individuals and organisations for scientific and technical information with a view to bringing forward proposals which will assist in the formation of a national policy in this important area. It will assess the adequacy and availability of existing resources and the access to them. It will also study the use of computer-based information retrieval systems drawing upon overseas experience with such systems.

The Committee of Enquiry aims to complete a major part of its work this year. Individuals or organisations wishing to submit comments or to obtain further information about the scope and objectives of the committee are invited to contact the Committee Secretariat, C.T. The National Library of Australia, Canberra, A.C.T.

## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the list is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total D.X.C.C. credits given, including deleted countries. Where totals are the same, listings will be alphabetical by call sign.

Credits for new members and those whose totals have been amended are also shown.

### PHONE

VK8MS	318/343	VK2APK	289/296
VK8RU	316/348	VK4FJ	286/307
VK8AM	310/388	VK4TY	284/284
VK8KS	307/323	VK8UC	278/278
VK8MK	303/334	VK3AAK	274/279
VK8AB	299/314	VK3ZE	273/275

### New Members

Cert. No.	Call	Total
122	VK4NG	195/195
153	VK4RB	190/198

### Amendments

VK3JW	237/258	VK3ACD	234/258
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### C.W.

VK3QL	263/286	VK3AKK	271/278
VK3LQ	260/288	VK3BL	264/284
VK4FJ	259/315	VK8RU	268/289
VK2APK	286/294	VK4TY	268/272
VK3YI	265/293	VK3TL	264/265
VK3NC	273/300	VK3RJ	248/252

### OPEN

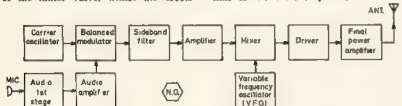
VK8RU	317/353	VK8MK	303/324
VK8SD	315/350	VK8JO	301/328
VK8VN	311/330	VK3ARK	301/308
VK8KS	308/327	VK8UC	286/286
VK4TY	285/321	VK4FJ	284/284
VK2APK	282/315	VK2SG	284/280

### New Member

Cert. No.	Call	Total
127	VK4NG	195/198

### Amendment

VK3ACD	234/259
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## Enquiries are invited for the purchase of COLLINS 390 and 390A Communications Receivers

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Finance available. Apply in writing to:

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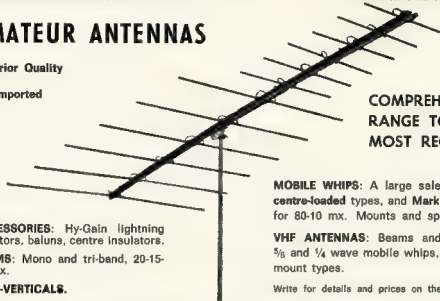
6th Floor, 288 LITTLE COLLINS ST., MELBOURNE. Phone 63-9258



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**VHF ANTENNAS:** Beams and ground planes,  $\frac{5}{8}$  and  $\frac{1}{4}$  wave mobile whips, including gutter-mount types.

Write for details and prices on the types you require.

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South Aust. Rep: **FARMERS RADIO PTY. LTD.**, 237 Angus St., Adelaide, S.A., 5000. Telephone 23 1296  
Western Aust. Rep.: **H. R. PRIDE**, 26 Lockhart Street, Coober, W.A. 6182. Telephone 90-4373

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AND COMPONENTS**

# Army Trek to Ayers Rock

LIEUT.-COLONEL J. McL. BENNETT,\* VK3ZA

Thirty-nine apprentices from the Army Apprentices School, Balcombe, Victoria, left Balcombe on June 4 on a vehicle trek to Ayers Rock.

The trek included a rare "field-day type" h.f. radio link—s.a.b. operation from the summit of the Rock itself!

A total of 18 vehicles took part in the 20-day training exercise which was code named "Exercise Pebble".

Two former members of the Special Air Service Regiment (Capt. John George and Staff Sgt. Jock Lowson), both of whom are now on the Staff at Balcombe, used the Army's latest man-pack h.f. radio, the PRC-F1, to establish the link with the Army Apprentices School, Balcombe, Vic., from Ayers Rock.

## EQUIPMENT DETAILS

Manufactured in Australia by A.W.A. Ltd. for the Australian Army, the PRC-F1 has the following characteristics:

Frequency range: 2,000 to 11,999 KHz. in 1 KHz. steps.

Frequency stability:  $\pm 25$  Hz. between  $-21^{\circ}\text{C}$ . and  $+71^{\circ}\text{C}$ . over 90 days.

Modes: S.s.b.-u.s.b. only; c.w. and a.m.

Output power: 10w. p.e.p. on s.a.b. and compatible a.m., 5w. p.e.p. on c.w.

Rx sensitivity: 0.5  $\mu\text{V}$ . in series with 50 ohms for 1 mW. audio output in 100 ohms.

Power source: 28v. d.c. from internal re-chargable nickel-cadmium battery.

It is designed primarily as a man-pack transceiver, using an 8 ft. whip antenna. An adjustable dipole is also provided for sky-wave operation over extended range.

A conversion kit, including an antenna coupler, allows the PRC-F1 to be used as a ground station with greater flexibility by giving a choice of a wide range of antennas. The coupler provides efficient matching from the 50 ohms unbalanced output of the transceiver to antennas with impedances between 5 ohms and 7,000 ohms.

## THE TREK

So much for the PRC-F1; now a little more about "Exercise Pebble".

The apprentices and their officers, and civilian instructors, ate combat rations and slept in the open throughout the greater part of the trip.

This living in the field under varying conditions plays an important part in the apprentices' training as do long distance vehicle movement, navigation, geography and geology, driver training and vehicle maintenance, and first aid in the field.

They visited major industries and places of interest along the way.

The expedition was conducted in two phases. During the first phase, the convoy moved from Balcombe, following the coast to Adelaide, then a general north-west route to Alice Springs along the main road.

Phase two included its return to Balcombe going through Ayers Rock, and taking a south-south-east route using the axis of the Alice Springs to Broken Hill railway line, then on through Mildura.

The apprentices spent most nights camped on the showgrounds of the various towns they passed through. In some cases they camped on the outskirts of a town while Army barracks were made available for their overnight stays at Adelaide and Broken Hill.

Fresh rations were purchased at Port Augusta, Alice Springs, Oodnadatta and Broken Hill, and meals were provided for the party by Army units at Adelaide, Woomera and Bendigo as it passed through these areas.

Among the highlights of the trip were inspection tours of the shipyards at Whyalla and the Iron Foundry at Iron Knob; a guided tour of Woomera; Opal prospecting at Coober Pedy; a day spent climbing Ayers Rock; and a guided tour of Broken Hill.

The apprentices were granted local leave, at the discretion of the Detachment Commander, Capt. A. J. George.

These phases of "Exercise Pebble" provided a break in what was essentially a rigorous training exercise.

But no matter what the conditions, the apprentices were well prepared for their trek.

Each light vehicle was fully self-supporting for the occupants, carrying rations, water and all their personal effects.

A mobile automotive repair shop and an ambulance were among the vehicles in the convoy.

In addition, each vehicle carried two-way radio equipment and communications with the Royal Flying Doctor Service, Balcombe, and Watsonia could be provided, as required, by a Signals Detachment.

The convoy arrived back at Balcombe on June 24 after covering a total of 3,446 miles and maintained communications throughout the trip.

## DISTANCE CHART AUSTRALASIAN LOCATIONS (centre pages in Nov. "A.R.")

Can be printed on stiff paper for wall mounting. If demand is adequate, at a nominal price.

Please write in to Editor if you require a copy

(it is regretted that individual letters cannot be acknowledged)

P.O. Box 36, East Melbourne, Vic., 3002

## DISTANCE CHART WALL MOUNTING?



Capt. George and S/Sgt. Lowson pictured near the summit of Ayers Rock with the 'Centre' unfolding below them—the curved horizon proves that the world is not flat! What a take-off for v.h.f.

\* Assistant Director Army Public Relations, Headquarters Southern Command.

# Equipment Recommended for Operation with Amsat-Oscar-B

Three communications repeaters are being developed for the Amsat-Oscar-B series of Amateur satellites. A selection has not yet been made as to what combination will be best for the best selling repeater. Your comment has been prepared to better help you get ready for operation with this series of satellites.

## OPERATION WITH THE D4J2E/D25KQ 482-70-144 MHz REPEATER

The D4J2E/D25KQ "H" repeater, described in March '71 "Amateur Newsletter," is a multi-p.a.-excited linear amplifier that uplinks signals between 432.125 and 432.175 MHz, and repeating them between 145.975 and 145.925 MHz on the downlink. Sideband inversion occurs in the transmission process. The upper sideband becomes lower sideband, and vice versa.

To transmit signals through this repeater, a 425 MHz transmitter and antenna delivering 200-300 watts of effective radiated power (e.r.p.) is recommended. For best results a.s.b. and c.w. should be used. Although a m. f.m., m.c.w. and a.f.k. will work with the repeater these modes do not make efficient use of the limited receiver power and should be avoided. We recommend that the converter be used to frequency-translate from 25 or 144 MHz to 432 MHz. In this way, a ten or two-metre s.a. or c.w. transmitter can be used for v.f.o.-controlled transmission on 432 MHz. For c.w. operation, an amplifier/triplexer can be used to frequency-multiply the output of a two-metre transmitter to 432 MHz. Use, for example, "Ham Radio" Feb '70. A variable tripler can also be used (see the A.R.R.L. Handbook). Perhaps the most expensive method of generating c.w. power on 432 MHz is to obtain a surplus 400 MHz f.m. transmitter and modify it for c.w. operation on 432 MHz. An article on this approach is planned by the A.R.R.L. Headquarters staff for a future issue of "QRP". It is strongly recommended that some provision for adjusting the power output of the transmitter be included. This is desirable to be able to adjust for the proper balance of satellite repeater power among users.

The antenna gain recommended for transmission to the satellite repeater will depend upon the transmitter output power. A 20-watt transmitter will require a 10-12 dB antenna gain to obtain the recommended e.r.p. of 300-330 watts. A 30-watt transmitter would be to add a 200-watt power amplifier, in which case a dipole or ground plane should provide enough uplink signal to the satellite, and then there will be no need to keep the antenna pointed toward the satellite. The satellite antennas for this repeater will be circularly polarised, so that linear polarisation (either horizontal or vertical) can be employed on the ground. Circular polarisation can be expected to provide as much as 3 dB over linear and is probably worth the effort. Because the spacecraft will be magnetically stabilised, the orientation of the satellite will be constantly changing and the sense of polarisation will depend upon ground station location. Stations in the northern hemisphere should use right-hand circular polarisation and those in the southern hemisphere, left-hand circular.

For receiving, any good two-metre converter should be suitable, and a two-metre receiving antenna having a gain of 10 dB or more should provide good results. Linear polarisation is satisfactory, but again, circular polarisation can be expected to provide as much as 3 dB improvement (use right-hand circular in the northern hemisphere, left-hand circular in the southern hemisphere). If a 10 dB antenna is not available, a ground plane or crossed dipoles should provide detectable signals from the repeater's 18-watt p.p. transmitter. The receiver should be 10 dB or more receiving a.s.b. and c.w. (i.e. have a b.f.o., and a bandwidth less than 4 KHz), and most h.t. units should be suitable for this purpose. Transceiver operation is NOT recommended, because it is highly desirable that a station be able to monitor their own downlink signals during the periods in which they are transmitting.

## OPERATION WITH THE AMSAT TWO-TO-TEN METRE REPEATER

The Amate two-to-ten metre repeater, described in March '71 issue of "Amateur Newsletter," is a multiple access linear translator which receives uplink signals between 145.900 and 145.950 MHz and retransmits them between 29.500 and 29.450 MHz, on the downlink. Sideband inversion takes place in the translation process (i.e. upper sideband becomes lower sideband, and vice versa).

To transmit signals through the two-to-ten metre repeater, a two-metre transmitter and antenna capable of providing 80-100 watts of e.r.p. is recommended. For best results, a.s.b. and c.w. should be used. Tight focus should be used. The repeater should also be demonstrated that a.s.b. and f.m. signals are not very readable when shared by the repeater, and they make a very inefficient use of the limited receiver power (1-3 watts). C.w. operation is generally possible with most two-metre transmitters. The most important means of achieving an a.s.b. capability on two metres is through the use of a transverter which can up-convert the output of a ten, twenty or six-metre s.a.b. or c.w. transmitter to two metres. Transverters of this type are available from several Amateur radio manufacturers, and are also described in A.R.R.L. Handbooks and the V.h.f. Manuals published by the R.S.O.B. and A.R.R.L. Transverters are also usable on c.w., and have the added advantage of providing a v.f.o. capability if the basic transmitter already has a v.f.o.

The antenna gain recommended for transmission to the two-to-ten metre satellite repeater will depend upon the transmitter output power. A 20-watt transmitter will require a 6-7 dB antenna gain to obtain the recommended e.r.p. of 80-100 watts. It would be preferable to use a transmitter in the 50-100 watt power output class, so that a nondirectional dipole or ground plane antenna can be employed and pointing of the antenna toward the satellite will not be necessary. The satellite two-metre receiving antenna will be circularly polarised, so that linear polarisation (either horizontal or vertical) can be employed on the ground. If circular polarisation is available at the ground station, as much as 3 dB less transmitter power will be required for good communications. Stations in the northern hemisphere should use right-hand circular polarisation, and those in the southern hemisphere should use left-hand polarisation.

Any good h.t. receiver capable of receiving a.s.b. and c.w. on the ten-metre band should be suitable for receiving the ten-metre downlink signal. The receiver sensitivity is one microvolt/metre or better and the local noise level does not exceed this level. A circularly polarised crossed-dipole should be adequate for receiving in low-noise environments, but a higher gain antenna, such as a three-element beam should provide better results, especially if the receiver is polarised. The satellite ten-metre transmitting antenna will be linearly polarised (a dipole), and Faraday shielding could be expected to occur just as was the case for Australia-Oscar-B. Circularly polarised receiving antenna is used at the ground station. The use of transverters is NOT recommended. Separate transmitter and receiving equipment should be used because it is highly desirable that all stations be able to monitor their own downlink signals while transmitting.

## OPERATION WITH THE AUSTRALIS 144-70-435 MHz REPEATER

The Australis 144-435 MHz repeater is a channelized, bandpass filter type of modulation/remodulation type, and is designed to handle f.m. signals only (c.w., a.s.b. and c.m. cannot be used with this repeater). The repeater receives f.m. uplink signals on 145.900, 145.925, 145.950, and 145.975 MHz, and retransmits them on 435.10, 435.125, 435.20 and 435.25 MHz, respectively, on the downlink.

Transmission of signals through the 144-435 MHz repeater will require a two-metre transmitter and antenna capable of providing a minimum e.r.p. of 200-300 watts. Only f.m. should be used, with a deviation of plus or minus 7.5 KHz. [The following could also be used: A2, F2, P4 or slow scan L.V.-Ed.] Available two-metre f.m. Amateur transverters and converted ham-band radios should be satisfactory, but a power amplifier should be used to increase the output power. If the power output is 50 watts, a 6-8 dB antenna gain

should be sufficient. It would be advantageous, however, to use a power amplifier in the 300-500 watt power output class so that a nondirectional dipole, ground plane or vertical antenna can be employed without requiring pointing towards the satellite. The satellite two-metre receiving antenna will be circularly polarised, so that linear polarisation (either horizontal or vertical) can be used on the ground. The use of circular polarisation on the ground will reduce the transmitter power requirements by as much as 3 dB (use right-hand circular polarisation in the northern hemisphere, and left-hand circular in the southern hemisphere).

Reception can perhaps most easily be achieved through the use of a good, low-noise 435-10-144 MHz receiving converter which will convert the same two-metre f.m. transceiver that is used for transmission. These converters are commercially available. A high-gain circularly polarised receiving antenna should be used, with a gain of at least 12 dB, because this antenna is expected to provide an output power of less than one watt per channel to individual linearly polarised monopole antennas.

Reprinted from Amateur Newsletter, Sept. '71. Membership, Amsat can be obtained for US \$3 on completion of application form available from Federal Executive. Application to be sent to P.O. Box 27, Washington, D.C., U.S.A., 20044.

## ANTENNA PARTS, KITS



**QUAD HUB: \$17.25 + p/p. \$1**

### QUAD KIT

consisting of Hub, Spreaders, 350 ft. 16 s.w.g. wire, Nylon line, Insulators and Araldite With matched Bamboo Spreaders, If available—\$44.00; with composite Aluminium tube/10 ft. solid fibreglass spreaders, \$82.00.

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8 ft. x 1/2" butt, 1/4" tip, solid F/G, \$3.00.

8 ft. x 9/16" butt, 1/4" tip, solid F/G, \$4.00.

Brass tip chuck, 50c.

Brass bottom fitting, spec'ly 3/8" UNF (SAE) or 1/2" Whit. tit, \$1.00.

Long items must be sent freight fwd. on road or rail. Copies of March 1970 "A.R." article available by sending S.A.E.

### S. T. CLARK

P.O. BOX 45, ROSANNA, Vic., 3084. Ph. 45-3002

## BEWARE OF CHAIN LETTERS

Another batch are in circulation  
If you get one, tear it up!

# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

## V.H.F. TRANSEQUATORIAL PROPAGATION

Editor "A.R." Dear Sir,

The Ionospheric Prediction Service is currently carrying out investigations into V.h.f. Transsequatorial Propagation and would be grateful for the assistance of any Amateurs who have had contacts via this type of propagation or have observed v.h.f. signals originating from countries in the northern hemisphere.

We are interested in reports dating back to 1947 if possible and, in particular, reports from January 1970 to the present.

Reports containing as much of the following information as possible would be appreciated:

- Date.
- Time (note whether local or GMT).
- Frequency or band (most likely to be 50 MHz, however if other signals were noticed, note approximate frequency).
- Signal strength.
- Fading characteristics.
- Location of your station and call sign (plus location if possible) of stations heard or worked.

(g) Other observations, i.e. was sporadic E noticed at the time, if so, what areas? Did the signals start in one area and move to another or out? When were signals first noticed and when did they disappear?

Reports should be sent to:

Dr L. McNamara,  
Ionospheric Prediction Service,  
152 186 Goulburn Street,  
Darlinghurst, N.S.W. 2010.

We would be grateful for as much publicity as possible concerning this project.

R. L. Harrison, VK3ZRY/2.

## N.Z. NATIONAL JAMBOREE

Editor "A.R." Dear Sir,

During the first week in 1973 the New Zealand Scout Association will be holding its Sixth National Jamboree at the Pukekohe Showgrounds in South Auckland.

I have been authorised by the New Zealand Post Office as Trustee for the Amateur Radio Station, which will be set up to operate during the activity period, i.e. 1st to 6th January, 1973. The official call sign will be ZL1JAM.

It is hoped to operate on all h.f. bands daily, and between the hours of 1800 and 1200 1070-2400 hours NZST, although other times can be arranged in the event of any pre-arranged schedules with overseas stations.

Members of the Franklin Amateur Radio Club and the Papakura Amateur Radio Club will be assisting in the setting up and operation of the station, and as it is anticipated that approx. 3,000 Scouts and Scouters from New Zealand, Australia, Canada, United States of America, the Pacific Islands, Japan and South East Asian countries will be attending, the traffic activity should be fairly intensive.

An attractive QSL card is being printed for the occasion, and confirmation will be 100%.

It would be appreciated if you could give this activity some publicity through your magazine and club nets.

John W. Hannaford, ZL1BBH.

## "HIS OLD BEAM"

Editor "A.R." Dear Sir,

In 1968 I bought, through Hamada, a TAE Jr. from Bert Ray, VK3AGW. Since then, I have contacted Bert on odd occasions and also worked a fair share of DX using his old beam.

A few days ago I received a letter from Bert which I feel is worth a para, in "A.R."

"A few days after we arrived back in this country on 4th May, 1971, I was preparing to get on the air with my old call sign G6KG (35 years old) I coupled up the rig in my bedroom with a 20 mX dipole coiled up on the floor and as the set warmed up there, without touching the dial, was VK3WW working a ZLA, with a signal from my old beam Q5 80, but on the speaker."

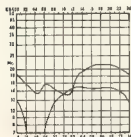
Sad ending—the beam was smashed during the big blow in Melbourne on 3rd October.

—M. O'Bertill, VK3WW.

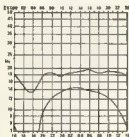
## PREDICTION CHARTS FOR DECEMBER 1971

(Prediction Charts by courtesy of Ionospheric Prediction Service)

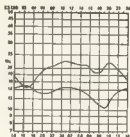
CAIRO - JAHANNESBURG



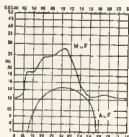
CAIRO - RIO DE JANEIRO



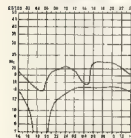
CAIRO - RIO DE JANEIRO



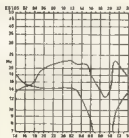
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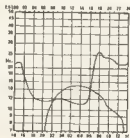
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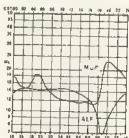
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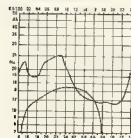
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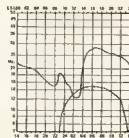
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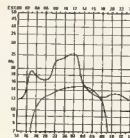
MELBOURNE - MONTREAL S.R.



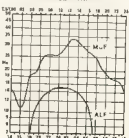
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## SPECIFICATIONS:

Frequency coverage: 144 - 145 MHz.  
Sensitivity: 0.3  $\mu$ V. for 6 dB. S + N/N.  
1st I.F.: 14.4 MHz., 2nd I.F.: 455 KHz.  
Bandpass Filter at 455 KHz.  
Input Impedance: 50 - 75 Ohms.  
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Audio output Impedance: 8 or 15 ohms.

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Kit includes all Capacitors, Resistors, I.F.'s, Pots,  
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Front end uses TIS88s; I.F., Dual Gate Mosfets.

Complete with Instructions and pre-drilled and etched Circuit Board

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**SPECIAL! 2N3055 115 watt 15 amp. 60 volt Silicon NPN Power Transistors \$1.50 ea.**

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- 12 Channels, 10 Watts output
- Modular construction.
- See "A.R." October for more complete details or write for spec. sheet.

**PRICE \$325 inc. tax** Yes, price is up!  
Blame the floating Yen! Terms available.

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# DIVISIONAL NOTES

## DIVISIONAL CALENDAR

- 3 Dec VKJ-V.H.f. meeting (Auction Night)  
Gosford meeting.  
Hunter Branch meeting.  
VKJ-V.H.f. Q. meeting (equipment)  
Disposal only.
- 5 Dec VKJ-V.H.f. Field Day (1100-1600).  
VKJ-V.H.f. Q. Field Day (1630-1030,  
1230).
- 11 Dec VKJ-V.H.f. Christmas Party and Fox  
Hunt.
- 12 Dec VKJ-E. Dist. Dist. R.C. Xmas Out-  
ing, Yarra Glen (all day).
- 14 Dec VKJ-Div Xmas Social.
- 17 Dec VKJ-General meeting.  
Gosford meeting.

## NEW SOUTH WALES

### MEMBERSHIP APPLICATIONS

The following were presented to the General Meeting on Friday, 24/9/71. Mr. R. Atkinson, 29 Macdonnell St., Yarralumla, A.C.T., 2606, Assoc. Mr. H. W. Buchler, C/o Gulf Fisheries (N.G.), P.O. Box 820, Port Moresby, N.G. VK5HIB, Mr. O. Dunkley, 4 Chambers St., East Australia, 2242, VK2HIB, Mr. J. E. C. Crouch, Residence, Austimur, 2514, Assoc.; Mr. R. N. Treges, 28 Trebor Rd., Pennant Hills, 1120, Assoc.; Mr. J. E. C. Crouch, C/o C. G. G. Humpster, 28 Chatham Ave., Taree, 2430, VK2BRC, Mr. V. Barker, 1 Rawson St., Epping, 2111, VK3VVT; Mr. A. S. Brooks, 11 Hawthorne South, 2041, VK2ZJ, Mr. R. N. Bullivant, 1/122 Old South Head Rd., Bellevue Hill, 2023, VK2BC, Mr. E. C. Crouch, Park Lane, Orange, 2800, VK2ZJ, Mr. R. Lawrence, P.O. Box 107, Kurlandua, T.P.N.G. Assoc.; Mr. S. G. Mudford, Roadside Mail Box 6, Green Creek, Roadside, 2440, VK2ZJ, Mr. S. 2700, Assoc.; Mr. J. J. Skerrett, "Glen Alpine," Werria Creek, 2341, Assoc.; Mr. H. Wilcoxon, 13 Tarran Cr., Baulkham Hills, 2113, Assoc.; Mr. D. E. Vaughan, 3 Hampden Rd., Lakemba, 2196, VK2FY.

Transfer from an Associate to a Full Member: Mr. J. Young, 18 Vernon St., Hunters Hill, 2110, VK2JZD.

### LOAN OF F.M. BASE STATIONS

The following clubs have f.m. base stations on loan from I.C.E.N. for W.A.C.E.N. purposes: Orange Radio Club, Macquarie Radio Club, Blue Mountains Branch, Central Coast Radio Club, Berrigalong Branch, Berrigalong Branch, Nepean Radio Club, and recently the Armidale Police Boys' Radio Club and Taree OK Youth Radio Club.

The following clubs made application, but were unsuccessful: Westlakes Radio Club, Casey Radio Club, and George Radio Society.

Please Note: No more applications as there is no equipment left for distribution.

### OKLEY REGION RADIO CLUB

A meeting was held on 2nd Oct. last by interested Amateurs from Port Macquarie and the surrounding area. It was decided to name the club as the Port Macquarie Radio Club. Peter Alexander was elected President and Owen Boydell Secretary/Treasurer. One of the main objects of the club will be to encourage the use of v.h.f., particularly 146 MHz. The first steps in the immediate future will be to obtain the equipment needed to make this possible. It is hoped that the locality of the repeater will be on the Middle Brother Mountain.

Henry VK2KHE gave the meeting a run down on the matters of the club, the equipment, and the necessary permits. At present there are active stations on v.h.f. at Port Macquarie, Taree, and Wauchope, and the number will be steadily increased as others get their rigs going.

The following members attended the first meeting: VKs 2HGF, 2ZKH, 2ZLX, 2XV1, 2ZGC, 2AW5, P.A., 2ABE and Bill Cullinan, who has yet to get his call sign.

### DX NEWS FROM VK2GJ

For those who did not hear previous Sunday's broadcasts, it is suggested that you have a pencil and paper handy each Sunday so that if you are interested in DXing, notes may be made of what is current on the bands.

### ILLAWARRA BRANCH

Memberships Project—Most of the work during Sept./Oct. was on site at Dapto. After the fans were placed in the tx cubicle the tx and the modified antenna were tested. The repaired co-ax. feedline. As the rx pre-amp was not operating, the tx feed was used to line up the dish again on sun noise. The chart

recorder was forwarded to Roger VK2BRE to have it "debugged".

The tx was then operated into the dish feed and P.M.G. acceptance tests were carried out. Difficulty in obtaining satisfactory stability from the oven controlled frequency source was overcome by placing it inside away from the breezes. The required stability of one part in ten million was then obtained and its frequency was adjusted to be within 50 Hertz at 435 MHz. The P.M.G. was then checked out and was also satisfied. We are thus now cleared for operation by the P.M.G. and the 12 month extension of high power permit has also been granted.

The job of suitably coupling the tx frequency source into the rx input was then carried out. A reference frequency tuning point on the 11. channel rx at tx frequency.

Minor modifications to the tx metering circuitry, etc., were then completed and all tx and power supply changes were labelled and designated all controls and functions. Roger VK2BRE has returned the chart recorder in excellent operating condition. We are now working on obtaining more output from the tx into the dish feed and in getting the rx pre-amp to operate satisfactorily. Parts are also being obtained for a sliding wrotoscope and photo-transistor unit to allow optical sighting of the dish on the sun and moon, to give accurate indication of the main lobe of energy on the moon.

### MORSE TAPE SERVICE

There is a Morse Tape Service available through the VKJ Division of the W.I.A. This service is available to anyone whether a member of the W.I.A. or not. The cost of this service is 20 cents per tape and the minimum is set at a maximum of two months. There is also a charge of 15 cents for tapes overdue over the two-month period, payment of either amount preferred by either stamps or postal notes in favour of W.I.A. VKJ Division.

To apply for a tape, please write and appreciate if the following information could be supplied in the application:

- (1) Name of tape recorder used,
- (2) Name of the tape recorder,
- (3) Maximum size of tape spool used,
- (4) Speeds at which it plays,
- (5) Which tape shown in the list under you require. It is required for only one tape to be supplied at a time.

The majority of the tapes available are on 5-in. spools two-track at a speed of 3 1/2 i.p.s. There are also tapes available on 1 1/2 in. spools at 1 1/2 i.p.s. Tapes available from the service are as under:

Beginners' special, 60 mins.  
No. 1 1/2 in. 10 w.p.m. plus 1/2 hr. 5 w.p.m.  
No. 2 1/2 in. 7 w.p.m. plus 1/2 hr. 8 w.p.m.  
No. 3 1/2 in. 10 w.p.m. plus 1/2 hr. 11 w.p.m.  
No. 4 1/2 in. 10 w.p.m. plus 1/2 hr. 12 w.p.m.  
No. 5 1/2 in. 10 w.p.m. plus 1/2 hr. 13 w.p.m.  
No. 6 1/2 in. 10 w.p.m. plus 1/2 hr. 14 w.p.m.  
No. 7 1/2 in. 10 w.p.m.

There are also several tapes available that consist of code groups rather than the plain language of the ones listed above.

For the supply of tapes or for further information contact the Morse Tape Supervisor, Mr. M. Francis, Kingston St., Seona, 31 W.V., 3337.

## VICTORIA

The summer season of sporadic E propagation at Melbourne North on 24th and 30th May. The officers are chasing the excellent interstate contacts which can be had using this form of propagation.

The Right Honourable Lord Casey, K.G., P.C. C.M.G., C.H., M.C., K.S.J., has consented to become the Patron of the Eastern and Mountain Districts of the Victorian Division. Lord Casey has a very distinguished record of service to Australia. He served in many positions, both in Australia and overseas. He was Governor General of Australia for 3 1/2 years from 1960 to 1969. Now in retirement, he still takes an active interest in many community activities.

News for inclusion in the Victoria Divisional Newsletter should be sent to the sub-editor, Gill Somes, at P.O. Box 36, East Melbourne. Remember these notes are based on the information supplied and you want to see it in print, please send it in.

Merry Christmas and a Happy New Year from the Victorian Division.—VK3AJU.

### \*\*\*\*\* ADVICE

The Eastern Zone held their annual convention at Mirboo North on 24th and 30th May. The office-bearers for 1971-72 voted in were: President, Lee De Vries, VK3XAM, Vice-Pres., Bruce Hocking, VK3ADB (ex-3ZFW), Sec.,

Gavin Kuch, VK3ZMC, P.O. Box 175, Maffra; Station Officer, David Scott, VK3DY; Zone Officer, Geoff Turner, VK3ASV; Zone Secretary, Gordon Brown, VK3ASV; Zone Treasurer, Harry Ewert, VK3ZX; Zone Intruder Watcher, VK3ASV.

In the retiring President's report, Rodney VK3ZJ stated "This Zone is steadily becoming the most active in the country in nearly all facets of Amateur Radio. I say this with firm conviction that this is indeed true, and provided the enthusiasm and energy of most of our members continues, our Zone will be widely known for its activities in the promotion of Amateur Radio in general."

The Zone is running three successful A.O.L.C.P. classes, Warragul supervised by VK3UG, Traralgon by VK3BBB and VK3VEV, and by VK3ASV at VK3ASV. At the August exam, we had seven passes, all now awaiting call signs. A Zone sub-committee was formed in 1970 to research into and make recommendations on the feasibility of a lower class of Amateur licensing. The final report was presented at the Eastern Zone general meeting at Traralgon on 31st July, which was published in October "A.R."

The Zone held a further general meeting on Oct. 2nd at Traralgon. Amateur tv. experiments in the 435 MHz band were discussed at the Zone Convention and also at the Hobbes Exhibition held at Morwell on June 4 and 5. The committee of VK3BZ, VK3BY, VK3ZXM and VK3ASV/T VK3KR and VK3ABK are also experimenting with a.t.v. and also with a group of VK3ASV and VK3ABK also takes up skeys using r.t.t.v. with Noel VK3NR of Melbourne using h.f. and v.h.f. 2 m.f.m. (146 584 MHz).

## SOUTH AUSTRALIA

With the changeover to summer standard time, the use of Greenwich Mean Time will save much confusion during the coming months. Although accepted band opening times will be asked,

The main activity during October was a visit to the Cadzina O.T. Earth Station organized by a Group of 10. The group had equipment and dish used to communicate over-seas telegrams, phone calls and television programs. The group was very successful over the Indian Ocean. The visit was a great success, both as a social outing and as a technical experience. About thirty Amateurs were present with about twenty friends and relatives using all acceptable modes of mechanical transport.

Visitors came from near and far, with Tony VK2ZAI from Bordertown the furthest and John VK2ZJB, one of our guides over the station, the nearest. Everyone really appreciated the facilities and techniques required to set up and maintain the station.

On the home front, further progress in finding a permanent home for VK3W1 has been demonstrated by the committee actively investigating the few alternatives found. A conception of a technician licence requiring full knowledge of basic and low level propagation at 21 MHz upwards, together with an eventual lower limit of 144 MHz for Limited Licences, has been put forward. As the Divisional meeting v.h.f. operators are worried about the clash of interests on 146.9 with the Australian satellite repeaters and so there is plenty to talk about.

Our enthusiastic Short Wave Listener representative on Divisional Council, Tom Hannard, could not attend the meeting. He has been persuading his short wave listener enthusiasts to use their skills as listeners to man the Intruder Watch. Amateurs find many jobs in their hobby from serial construction, operating, and receiving, so listening can only be a small part of time available. 8 w.p.s. with the listener expert in serial construction time on construction or transmitting, will be able to pull their weight in the W.I.A., and assist in the many ways necessary to ensure this vitally necessary job of Intruder Watch. It is a long job, requiring definite receiving skills in identifying codes, transmissions of teletype, facsimile, audio, and other. Your thoughts are with you Tom, and your counterparts in the other States. If 8 w.p.s. can handle this job, the listener is certainly well that much stronger. VK2GZ.

W.I.A. 52 MHZ. W.A.S. AWARD

New Members:		
Cert. No.	Call	Additional Countries
87	VK2ZBY	1
88	VK2ZGJ	1

Sub-Editor DON GRANTLEY  
P.O. Box 222, Penrith, N.S.W., 2750  
(All times in GMT)

When I handed this column over to the Editor a few months ago little did I think it possible that I would be taking it over again within such a short space of time. Difficulties which existed at that time have been resolved, and I am very pleased to be back on the job once again. One of the reasons for this column and this in itself is a big factor in the successful handling of any task. It is my intention to gradually get away from the practice of entering all my information from overseas news sheets where possible, and I will in future rely on reports and assistance from the VK gang, and my own listening.

A column of this nature can be divided into three essential features, reports of future events, identification of recent happenings, and information which will enable the reader to acquire his QSLs. Any information of this nature will be greatly appreciated. Box 222, Penrith, 2750, will find me, or a call to Springwood 511394 will do the trick.

In a recent newspaper article published in a Sydney weekly, the Australian Radio got quite a lot of favourable publicity, however the main interest to the writer seemed to be a discourse on Alan Fairhall, and King of the Waves in passing mentioned that it is possible to converse with people in all walks of life through the medium of Amateur Radio. The writer is quite right, as my brief list will show. At one stage, three of the Princes of Saudi Arabia were active using the calls HZ1AF, HZ1TA and HZ1IS. OZ1AJ, the Austrian pretender, UALLO was the late Yuri Gagarin. Arthur KLIBB is radio personality in the USA, and WBAI was used by Andy Devine, KONWY and WYAY were used by band leaders Tex Bencke and Pee Wee Paul. KX4AK, K. Lawrence, was a radio range rider. W3ZXM was the skipper of the ill-fated Flying Enterprises, and who is often heard operating maritime mobile. Several prominent businessmen, politicians and business men are active on the bands, also many of the world's social and religious leaders.

Next time you want to know who's "handle here" and who's "dig into his background" a little and you will find that he is one of Hollywood's best known character actors, or a prominent U.S. Senator. Many of them will be far more interesting if a little more interest was taken in the person on the other end of the contact.

Band conditions at the time of writing are fair, the noise level is starting to creep up on 80 m, but VK3QLZ lists many goodies on this band on 80. The DX on 40 over the opening weeks of October has been really good. The South American countries are still belting in on 40, in a variety of what the VK segment has been loaded. 30 metres has been livening up on around 1130z, and most times that I have checked 15 there has been a plentiful number of contacts available for the taking. As a matter of possible interest to those chaps who have been indulging in verbal contact over the radio, the noise level of Novice licensing, have a look at 2110z to 2125z when the band is open, in fact do a little better, give them a shout, they will surprise you at the time. Some time it will give true picture of Novice activity. I have not been watching 160 metres, however the word is that the proverbial "noise" is not the noise of the G band boys who will be active during the summer will be chasing the VKs in the evenings on this band. If anybody does have possible contacts on top band, I suggest he has a talk to George Allen over in VK6. George has the score on the board in regard to the rewarding band.

W6PHM/DJ1, currently active on 30 c.w., will be leaving that country for VQR where he should be operating from January. VQR is 1972 after which date he returns to his home state.

Ed YALNOT has been active daily on 1400z or 1430z for QSLs. He is now on the way to YALNOT, E. S. Popko, PAA/Kabul, Dept. of State, Washington, D.C. 20521, or direct to him at Box 379, Kabul, Afghanistan. His dress may be used for all YA QSLs as the box is shared by the gang. OAIV contact station will be active till the year's end (s.a.b. all).

Overseas news pertaining to DX activity is broadcast by the Northern California DX Club every Sunday at 1800z and on Mondays at

0000z. The frequency is 1600z, and this session is well worth listening out for if you want to be in the picture regarding current news. Also listen to Div broadcasts, particularly VKX by VK3QLZ, and VK3 by Harry Roach.

WH3K can assist with QSLs on the following stations: UHRAE, UHABG, UHBB, UH-BCS, UHBCD, UHJAC, UHJAF, UHJKA, and UKANMA plus any IRL station. Send your requests to WH3K, c/o IRL, 5436 S.W. 11th, and allow several months for a reply. He asks that S.W.I. refrain from sending their reports through him, which is a fair request, in any case I have never had trouble with S.W.I. reports being answered from behind the iron curtain. I bundle them off about twice a year to Box 81, Moscow, and the replies should come through even if some of them are five years in so doing.

Nicaragua activities are maintained by YN-20M and his x.y.l. YN3CN (44 Mhz. a.s.b.) and YN3AAA (s.a.b. on 40 and 80).

Ceylon stations are once again on the air after being closed down from April 10 to Sept. 13.

S.V.O. stations still around are SV0WBS and WL1, both active from Crete, whilst SV0WE and SW0WU are at it from Rhodes. Dodecanese is to be more precise.

Chaga with VQ0WES still active on 14 and 21 a.s.b.

There has been the usual spate of odd preface of late some of these are from operators either on the spot, but none of interest. HUBA was a special call used by Y3CEN from El Salvador. HWEKAW was a special used by Y3CEN club at HWEKAW. OIR was ORIVR using a contest call. Most of the foregoing were used for contest purposes.

Call areas and allocations for PZ Surinam were made available recently. PZ1 Paramaribo and Surinam, PZ2 Nickerie, even though PZ4 Paramaribo, PZ5 has been reserved for reciprocal licences, PZ6 Para, PZ7 Brokopondo, PZ8 Commewijne, PZ9 Maricao and PZ10 has been reserved for special stations.

A memo here for the DX chasing S.W.I. I am holding cards here for L1150, Q30JH, L2940, L2941, L2942, L2943 and L2944. If the holders of these numbers would send me their mailing addresses I would be delighted to forward their cards to them. As S.W.I. is expecting cards to be returned via the Bureau should drop me a line with their address so that I can expedite the delivery of their QSLs.

The ID stations IIBG/ID and IIBU/ID which were active earlier this year can be seen on 1400z on 1410z. The suffix counts as for Italy, whilst the IE stations which were active a little while ago count as Sicily, for those societies who claim the Italian suffix as separate. The QSL address for ILEIUG, ICIUG and ICIAA is Box 143, Palermo.

U.S. Samoa still well represented with K50DR, DT and DX still appearing in the lists of calls worked. In each case they can be reached C/a. Dept. of Commerce, Pago Pago, U.S. Samoa 96060, Pacific Ocean.

BY1AB and BY1NK have been constantly heard and worked, the former on c.w., the latter on s.a.b., however there is a very strong feeling amongst the chaps on the bands both are pirates, as is possibly the case with BV2A. I would be pleased to hear from anybody who has received these calls and has the QSL card back. There is a tendency amongst writers to brand as a pirate anything which to them seems a little out of the ordinary and in many cases they are right, however it would be interesting to know for sure if the stations they name as pirates are in fact what they truly are.

EX3A stations which still drop up are AI KX3VA who has been on 31 MHz., QSL to Box 30, Bulwer, FSCC, BP 61, Nymanas, St. Andrew, N. DL3AO, and KX3L whose manager is WYWR.

6W1AF provides mainly week-end activity from Yemen, s.a.b. on 14 to 30 MHz. bands.

#### AWARD

A note to hand here re the Thunder Bay Award, this is available to any Licensed Amateur who has worked 100 stations in 10 Bands since Jan. 1, 1970, the date of amalgamation of Pt. Arthur and Fort William, GCR list plus the Thunder Bay Award, Box 271, Station "P", Thunder Bay, Ontario, Canada. VE3ARN, A.V.S. DP, EDG, EEF and HU are possible contacts. The award is available to S.W.I. on a board basis.

Arabian Night Certificate—10 Arab countries including JY.

Persian Empire Award—5 different EP stations (including KX3DX) contacts in the year to 31/12/72. For info and award by Dr. Rezaei Amateurs to Am. Rad. Soc. of Iran, Box 1000, A.P.O., New York, NY 08000, U.S.A. ("CQ" Oct.).

#### QTH SECTION

ASAC—Box 310, Gaberones, Botswana, Africa.  
BZ3CZ—Box 100, Gaberones, Africa.  
CR18S—Box 101, Frial, Cape Verde Is.  
CR3VJ—Box 306, Bissau, Portuguese Guinea.  
West Africa

EAEJ—Box 100, Biededo P., Calle Madrid, Azlan, Spanish Sahara.  
KASAL—Angel Moro Garcia, Ejercito Espanol.

ET3ZU—Box 379, Asmara, Ehiopia.  
FP3CT—Laurent Briand, B.P. 367, St. Pierre, St. Pierre and Miquelon.

FR1AF—Michel Piolet, B.O. 307, St. Denis, Reunion Is.  
FR1AG—Francis Pepin, B.P. 319, St. Denis, Reunion Is.

FR1AN—Claude Ntrac, B.O. 319, St. Denis, Reunion Is.  
FR1AT—B.P. 4, St. Clotilde, Reunion Is., Indian Ocean.

HB18S—Box 2008, Bangkok, Thailand.  
KX3LG—Box 150, Yap, West Caroline Is.  
96033, Pacific Ocean

KG4CS—P.O. Box 34, F.P.O. N.Y., 09893, U.S.  
KX3EB—Box 1474, A.P.O., San Francisco, Calif. 96333.

MP41J—Box 146, Bahrain Is., Arabian Gulf.  
PJ1HT—Box 879, Curacao, Netherlands Antilles.

PZ1AB—Box 71, Nickerie, Surinam, South America.  
KZ3BR—Box 814, Athens, Greece.

TQ3L—Box 374, Benagui, C. Afr. Rep. (or 374, Benagui, C. Afr. Rep.).  
VL4W—Box 324, Victoria, Mahe, Seychelles Is., Indian Ocean.

WC3ST—Box 461, Lake Worth, Florida, 33460, U.S.A.  
ZDKX—Box 504, Bathurst, Gambia, Africa.

ZD7BB—Box 17, Jamestown, St. Helena, St. Atlantic Ocean.  
IR1AP—B.P. 593, Paramaribo, Malagasy Republic, Africa.

#### QSL MANAGERS

CT3BB via WAINRV	HUBA via WARDY
CT3AJ via VETWGO	HWEKAW via FKEAW
CNDW via W0GZ1	JWINW via LATRB
CE4AF via WASHUP	JXNRK via LATRK
DL3AA via D1Z1Z	JYAAA
EABT via DL1TF	JYBAB
F0ZCN via D1Z1Z	JY1
F1YVR via VE1VN	JY1
FG6MH via WBA1BN	JY1
FG6NH via WBA1BN	MP4TDT via DJEWY
GE3AS via DJ3PH	NSLSV via W3BVB
GM5WV P.O. GEUW	QASV via W0FP
H3A2T via K0VIF	VQWVES via WAJOTV
H30XV via H3BAGL	YN3AAA via DL3OH
H3BAGL via DL3OH	EW1AF via DL3OH

QSL information courtesy DOTM Bull. 3/71.  
VK3AKK, VK3AKX, VK3AUC, "H" July, VK3 Bulletin:

AC1TY—K3RLJ (c.w. & s.a.b. on 14, 1500z).  
IP1MOL, RB, RB1—DOTM (W0BKK, Box 288, Newark, N.J. 07107).

JD1ACF—Bonini—JAO1AF.  
K0BKB—Box C, Ponape, E. Car.

KF3J1—KFN—DOTM.  
MP41JG—Box 144, Bahrain.

PA1VL—Now DOTM.  
VA3UN—McGill Univ. Montreal, Jul./Dec.—DOTM.

VE1ASJ—New DOTM.  
VETINXU—Y2B7WG.

VK3KX—K4TK.  
3P11S (Panama)—DOTM as HP11E ("awaiting logs").

TQ1AA—K4CZD.  
MI3BG—Box 1, Dominick St., Attard, Malta (s.a.b. 14 MHz.).

That is about all I have for this month. I look forward to hearing from anybody who has an item of news, and this month I will be glad to provide assistance from the Long Is. DX Ann. and the ISWL (with late additions from VK3QL—Ed.) 72, de Don L3EE2.

#### STOF PRESS Announcement

#### V.H.F. COMMUNICATIONS

New Subscription rates for one year's issues:

Surface mail ..... \$3.75

Air mail ..... \$5.95

FEDERAL EDUCATION PUBLICATIONS

Closing date for copy 30th of month.  
Times: Eastern Summer (Daylight Saving) Time

## AMATEUR BAND BEACONS

VKO	52.525	VKXMT,	Mawson.
VKS	53.032	VKOTM,	Macquarie Island.
VKS	53.554	VKQV,	McKean.
VK3	144.760	VK3VE,	Vermont.
VK4	144.380	VK4VV,	10th W. of Brisbane.
VK5	144.380	VK5V,	Mo. Lofly.
VK5	144.800	VK5VF,	Mo. Lofly.
VK5	52.008	VK5VF,	Bickley.
VK5	52.800	VK5TS,	Carnarvon.
VK5	144.800	VK5V,	Barker.
VK5	145.010	VK5VF,	Bickley.
VK6	144.600	VK6VF,	Devonport.
VK7	144.800	VK7K,	McKean Island.
ZL1	143.100	ZL1VF,	Auckland.
ZL2	143.300	ZL2VF,	Wellington.
ZL3	143.300	ZL3VF,	Christchurch.
ZL4	148.400	ZL4VF,	Dunedin.
JA	91.985	J141GJ,	Japan.
W	90.991	W000A,	U.S.A.
HL	90.100	HL91J,	South Korea.
NE	92.100	ZK1AA,	Cook Island.
KH5	90.100	KH5A,	Hawaii.
KH5	90.015	KH5RU,	Hawaii.

Additions this month to the beacons list is that of another in New Zealand, ZLIVH at Dunedin on 143.400 MHz. Additional beacons are planned, including ZLIVHW for Hamilton, in the Waikato area, and ZLIVHT for Timaru. First commissioned area beacons outside the main centres will be 50 KHz above the main centre area beacon.

Leigh VK6WA/T in a short letter confirms the existence of a beacon at Mawson, VK3MEX, on 33.525, mode c.w., running 40 watts output, and beamed at Casey Base, which is roughly the same heading as the VK6. The beacon is running on 33.564 MHz. The VK6 is beamed at VK, and runs 80 to 100 watts of c.w. Additionally there is another beacon at Casey, beamed on Mawson, running about 15 watts, frequency 33.564 MHz. The VK6 is the only proposed activity in the Antarctica area, one could do well in keeping an ear and beam pointing South this DX season. It must surely be only a matter of time before someone makes a contact in the Arctic down there.

I was very pleased to receive a letter from Stan ZLAMB, of Dunedin, this month. Stan outlines the activity proposed for ZL4, which is to be a 100% DX station, and he wishes to make contact with this rare area. Stan reports he has a 100w a.m. final in the testing stages, and an antenna system which will enable him to make a complete a suitable two-stage pre-amp, possibly E8CC etc., to go ahead of this. He has completed one 5-element yagi with 15-20 db gain, and he is confident that they can be stacked. Limitations at his end are that their Channel 1 v.l. operates 54 to 61 mhz, and that the 100w final is not yet ready daily! However, Stan will be looking for VK contacts from about December to end of January, mostly at weekends, and he proposes to operate outside 10 hours, which means VK stations should look for him prior to the 2 p.m. (1300 Eastern Summer Time). After that time, he will be listening for DX stations. If some suitable frequency can be nominated for VK stations on which to listen. Thank you, Stan, for the information. I am sure that in addition, you can be assured to plenty of efforts to work you, there must be scores of stations in Australia wanting that ZL4 area for W.A.E.L.

Bob VK2BX is now in Albany and has been spending some time upgrading the beacon transmitters there. Advice comes from the VK2BX group in New South Wales that it has been proposed installing a second beacon in the VK2BX cabinet, operating on 20m. This would be a good idea, and it has been suggested that a limited time schedule be adopted, and also that power be regulated to 100 watts. The group would like equal a.r.p. Speaking with Bob one night on 80 metres, he further emphasised this point, and said that the group would consist of a few members, and some quite reasonable costs have been born by the Group, and their finances are definitely in the black. The group would be based in the City. Running costs alone for the present 2 mhz beacon are above \$40 p.w., and with two beacons this would be well over \$80 p.w. The group is reminding and remembering that the Albany 3 mhz beacon has been responsible for some 70 stations

will rise as time goes on, there may be groups to the east of VKS, principally in VK3 and VK2 as the main recipients of the Albany signals, who would be prepared to give some little help on an annual basis to keep this and either a 52 MHz. or ultimately a 432 MHz. beacon active.

Normally I would feel such matters were purely a Divisional one, and possibly some help could be forthcoming from the VK6 W.L.A. Division, the side benefits to the Eastern States is so great in this case, due to ducting and inversions which follow the coast line, that there could be valid reasons for some help in this. Perhaps the matter could be discussed in the two States mentioned, possibly VK7. Any action taken could be directed towards Bob VK6BF.

A copy of "QRM" has arrived on my desk. This is published by the Northern Zone of the VEC, VK2ZC, and is a very interesting reading. It contained therein in mention of the sale of the equipment of Len VETBQ, who was a member of the VEC, and was in the Division of the W.I.A. Len recently made a big decision, that at 81 years, he should retire. He had been working for the VEC since 1923, on 300 metres, progressing through the time the early days of 50 MHz, then followed by 144 MHz, and then 2.4 MHz. He was a gear. Many VK and ZL stations will recall the time when he was a member of the VEC, and possibly some of the other bands we do feel that he was a champion of the cause. However, the last time we saw him was at the VEC, and he was a chivalry has not been entirely lost, and based on quoting the sum of \$250 was raised for the VEC, and the reason for this was that he remained in the shack together with the QSLs on the wall reminding us of days gone by. He was a very good person, and a very good transmitter, a modulator and associated power supplies, so you haven't heard the last of TQW were." So Len will still be able to keep some contact with his son John VK3AAZ. We wish you and your family a very happy Christmas, from the readers of "Amateur Radio".

## PROJECT AUSTRALIS

Group discussions will be going on now on the subject of Australian repeater frequencies in relation to Project Australia A-O-B satellite frequencies. To bring you into the picture a little more, as this may be the first time you have read the frequencies (courtesy of VKZ V.h.f. and T.v. Group Newsletter) —

- (a) VK Translator System (In MHz.)  
Uplink: 145.800, 145.850, 145.900, 145.950  
Downlink: 145.800, 145.850, 145.900, 145.950
- (b) DJ Translator  
Uplink: Between 432.135 and 432.175 MHz.  
Downlink: 145.800 MHz.
- (c) Amstar Translator  
Uplink 145.900 MHz.  
Downlink 29.500 MHz.
- The Australia-wide Gen. repeater and simplex channels in the 2nd band are:
- | Repeater:  | IN      | OUT             |
|------------|---------|-----------------|
| Channel 1: | 146.1   | 146.6 Secondary |
| " 2:       | 146.2   | 146.7 Future    |
| " 3:       | 146.3   | 146.8 Future    |
| " 4:       | 146.4   | 146.9 Primary   |
| " A:       | 145.000 |                 |
| " B:       | 145.000 | Primary         |
| " C:       | 145.146 |                 |

Three possible solutions to these frequency conflicts proposed by the Australls Group are: (a) Changing the satellite channels, (b) Changing the VK repeater channel frequencies, and (c) Turning off the VK repeaters during each satellite pass. The Australls Group believes that the satellite frequencies are an optimisation of frequency conflicts all over the world. I have not before said much about repeaters and satellites in this column, as they are generally of little interest to the majority of those by these more directly concerned, but I know there are many who have not done their homework and followed these problems as presented before, so perhaps this limited outline of the situation is a right in the middle of your rules, which seem to be in a nice

### DX CALLING FREQUENCIES

From time to time I am asked about the establishment of DX calling frequencies, and usually advise that 52.010 MHz. seems to be fairly well established for such operation. As some stations have used it successfully for meteor scatter operation, there does not seem a need for another frequency. Therefore, I see no need at present to vary my answer, let alone ask for a DX call frequency.

Another point in favour of 53.610 is that it is only 10 KHz from 53.600, a point easy to establish accurately using a 1 MHz crystal.

carefully set up. In this way, providing you have stable equipment, you should be able to monitor the calling frequency when in the shack doing other things.

The whole idea is particularly well suited for a.s.b. operators and their transceivers. Similarly, if you are in the shack and not actively operating, your receivers should not listen to one part of the spectrum if not needed. The above mentioned DX calling frequency, then at least on some beacon frequency, the time of day and conditions will dictate to a certain extent where you ought to be listening or not. Forget it, you can't receive or transmit using one converter at the same time. You can use the converter into two or more receivers and set them on different places, if something comes up you will hear it.

And still on the subject of calling frequencies, remember that 14130 KHz. is the International v.h.f. liaison frequency, a call there may surprise you who answers sometimes. (Reminder also that 7060 KHz. is a VK calling frequency — Ed.)

## YES V.H.F. GROUP TWO

Congratulations to Ron VKJAKC, who was awarded the above trophy for 1971 for his efforts in breaking the Australian 1200 MHz record by working VK7ZAH in Launceston achieved after months of experiments at both ends. Ron was presented with an inscribed microphone at the Gembrook Rally on 10th September, by the Chairman of the V.h.f. Group, Gil VK3ATJ.

Bob VK3AOT sends along his usual interesting notes and the following are extracts from them: "Two metre activity in Melbourne is at its highest level for probably four years, many are being well aware of the potentialities of VK3DIX, and much upgrading of equipment has been going on during the winter months. Six metres has been going ahead, despite TV possibilities, and 10 stations can be heard on Sunday mornings following the broadcast.

\*Quite a lot of v.h.f. activity is planned from ZL this season. David ZL4PG and Bernie ZL4IS intend operating portable on a 5000-ft mountain on dates coinciding with the VK Field Days. They will use 8.0 to 61.5 a.s.b. 53.005 a.m., 2 metres a.m. and a.s.b., and 43 a.s.b., with 80 metres a.s.b. for season. ZL4PG operates 52.005 with 100 watts of a.m. most week-ends beaming VK Times are 0800 to 1130.

"The VK3 Eastern Zone 2 max beacon construction is nearly completed, tentative frequency until some national beacon plan is adopted will be 144 080 MHz. Launceston are thinking about a beacon, also Mt. Gambier and Sydney."

"Recently a group of Amateurs in Wollongong, N.S.W., conducted 432 MHz. moonbounce tests with KSMYC but results so far are no known. (Those concerned might let me have some information please—SLP)

"The VKI V.H.F. Group has decided to publish a list of suggested beam headings for use by Melbourne 3 max stations during periods of unknown conditions. If the more distant stations are to beam towards Melbourne at the appropriate time for a maximum contact may result. The suggested times and times are: Gippsland 1930, Tasmania 2000, Ballarat and Adelaide 2030, Western Victoria and Mt Gambier 2100, Northern Victoria 2130 and Northern Victoria 2305." (This sound reasonable and should well produce interesting results.—SLP) Thanks Bob for your continued interest.

The weekend of 4th and 5th December will be a good one for V.H.F. operation. Field days are being conducted in VK3 and VK6 and New Zealand as well, and there is reason to think there will be quite a few stations operating portable in all areas. VK3 portables are most likely to be set up and are expected to be operating on the Saturday night in readiness for a good start at 0730 Sunday morning. The one hour of daylight saving is going to help DX operating in the mornings this year, its effect giving an additional hour of operating before conditions fade out.

The last week-end of October saw the beginning of a nice SW inversion across the southern Australian continent. The some excellent 144 and 432 MHz DX Tony VK3ZDY from his prime location at Stirling in the Mt. Lofty ranges made the most of this. He was able to hear 2300 kHz on 144 J5, AKR, BDA, ZUR and AOT. Not content with that, he turned his attention to 432 MHz and had 5 x 9 contacts with Ron VK3AKC, Les VK3YDZ and Les VK3ZUR also heard Tony on 432 but were unable to make contact. Jack VK3NS also heard Tony at 5 x 9, but I understand that he was not able to hear him as he was going on in an easterly direction, things were also happening to the west, with Kerry VK8SU at Ceduna putting in a 5 x 9 signal.

(Continued on Page 21)

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## VHF NOTES

(Continued from Page 19)

to Adelaide. Bob VK3ZDX even worked Kerry on 8 m.x. and, but signals were considerably weaker than on 8 m.x. Others getting in on this two-way activity east and west included Mick VK3ZDR, Noel VK3VT, John VK3QZ and Jim VK6ZM. Much gnashing of teeth went on in my shack as the inversion did not reach the 20 miles inland to my location. I had to content myself with one solitary f.o. note from VK3SU and a very weak signal from VK3AOT, no contacts made, not a sound from any other station, but that's the selective pattern of these openings, and there was nothing I could do about it!

### TWO YEARS OF OPERATION

That's right. That's the length of time I have been trying to keep you filled in on some of the V.H.F. news of Australia. It has not been easy and still isn't. It takes a lot of time and much reading and sifting of material has to be done before copy can be prepared for "A.R." I am indeed grateful to a few regular contributors, particularly Bob VK3AOT, who is there every month with something, what a pull I thank those people responsible for the various bulletins and magazines I receive from different V.H.F. Groups etc. throughout the country. Currently I receive one or more such news mediums from VKs 1, 3, 4, 8 and 7 plus "Break-In".

If you feel your particular State has not been getting much written about it of late, then the answer is simple, no one writes to me! I do not undertake to give replies to letters unless specifically requested for information, time is too limited, but all sources of information are acknowledged each month in "A.R." as the particular paragraphs are prepared. The "Meet the Other Man" series has been temporarily discontinued due to difficulty of getting those contacted to write with information on the pro forma supplied. I will get it going again soon.

I would like to thank the Editor of "A.R." for his overall co-operation and understanding. He hasn't been too hard with the blue pencil, although a couple of times I have not agreed with him! However, after a month has passed by, time mellow one's thoughts and we proceed as before.

I will try and keep the page going for the time being. Constructive suggestions for improvements are always welcome, news items are ALWAYS welcome, but bear in mind I may not be able to include all you send, particularly if not of a national nature—this is where the Editor's blue pencil comes in! Please note all times as indicated at top of page are now daylight saving time as

related to Eastern Standard Time, and will remain this way until the March issue. Where a particular reference has to be made to time it will be referred to as "Eastern Summer Time".

Seasons greetings to you all for Christmas and the New Year.

The thought for the month, "Only he who attempts the ridiculous can achieve the impossible." 73, Eric VK3SLP, The Voice in the Hills.

## LINCTUS SYNAPSIOSEAE or Little Morsels

A receiver capable of detecting these transmissions need only consist of a pair of headphones connected to two earth rods separated by as great a distance as possible. (Rad. Comm. Dec. 70-1 KHz.)

They would not care to see c.w. waits ("73," Mar '71).

Drew particular attention to the development of the ultra-high frequencies and television which was the job of the Amateur today. (T. & R. Bull. Jan. 1932)

Two years ago I took a trip to Latin America. I had written to every Amateur Radio Association in the countries I was going to visit, giving them the exact date and time of my arrival, flight number, hotels where I would stay and I explained that I would like to meet with local Amateurs. I did not get one single (phone) call from them during the entire trip. However, I did manage to meet local Amateurs on my own. (WB3ACQ, Reception Centre for Foreign Amateurs visiting New York City, May 1971).

The use of voluntary services by thousands of individuals (Amateurs) on a world-wide basis provides a service to humanity in the advancement of scientific knowledge that cannot be matched by any single country (W.A.R.C. Geneva 1971, extract from U.K. Doc. 319).

The rapid growth of f.m. is beginning to catch up with us. In most major metropolitan centers 145 to 147 MHz. is full with repeaters and simplex operation; the top 10 MHz. of the 430 band is full with repeaters, simplex, up-links, down-links, and various control functions. 4 m.x. is rapidly filling up in non-channel 2 areas (FM in 'CQ' Oct. '71).

It is a curious fact that one of the longest standing unsolved riddles in this field (radio astronomy) is commonly studied with a simple h.f. yagi ("73" Aug. '71, in relation to the powerful sporadic radio emissions from, or near, the planet Jupiter. In the spectrum around 15 to 30 MHz.).

—H. F. Everick.

## OBITUARY



### DUDLEY NOURSE, VKEDQ

The key of Dudley Nourse is now and for ever silent. What kind of a man was VKEDQ? He was an exponent of the art of c.w. shorthand and typing.

He was a pioneer of s.a.b. and with home-constructed gear was an original member of the B. native "Sewing Circle". Ever willing to assist others, his cheery voice full of "sky-larking" could be heard on 80 m.m. evenings—only those who were close to him realized the tremendous suffering his war injuries caused him. He considered him a close personal friend and deeply regret his sudden passing.

Although his key is now silent, I'll wager he can hear us on u.s.b. and will some day p.t.t. again when we finally get in on his frequency.

Peace his XVI. Jean and harmonic Pam. I extend on behalf of those who knew him deep and sincere sympathy.

73 Dudley, CQ further down the log—VK3XB.

### ANDREW JOHN WRIGGLESWORTH VK3KW

Andrew's mother writes from Bangalore that he was only 25 years old when he died on 22nd of September. Andrew has been keenly interested in radio and was a member of the W.I.A.

He had had little time for transmitting, but had collected W.A.C. after constructing his own transmitting and receiving equipment, all of which had been done in spare time in the V.H.F. band at university, from which he graduated with honours in physics, and latterly when he was at home.

We offer sincere condolences to Mrs. E. J. Wrigglesworth and to all who had been associated with Andrew.

## PILE-UPS ON 435?

With the continuing progress on A-G-B, and the good prospects for SYNCART and SKY LARC, it looks like we will soon have several new DX bands. Unfortunately, different and more sophisticated equipment is needed to work DX at v.h.f./u.h.f., so, we probably won't see that many stations on the satellite repeater channels for a while.

If we get SYNCART working, though, the world will get around pretty quick about the new band. One might speculate. How long until we see the first "pile-up" trying to work a rare DX station? What rules of courtesy do we observe? Will the old DX pile-up problems reappear in the v.h.f. band? In satellite relay links, high power and high gain antennas are even more of an advantage than at h.f. Will the first satellite-relay DXCC award automatically go to the Amateur who is first able to put a kilowatt into a 30-foot parabola dish?

The answers to these questions are not in anyone's hip pocket. Some problems, like strong signal "capture" of the satellite repeater, might be eliminated in future design. Others, like the problem of wideband Amateur TV, and satellite channels on the same frequency, require a lot of understanding of everyone's part. Some problems, like the crank who wants to use his transmitter to hurt everyone else, will probably never go away.

The stakes that ride on a solution to our problems are higher in the satellite game than anywhere else. At Bowser's, in Corvallis, we were given notice that our performance on 435 will be looked at carefully. Our ability to get new bands and space links, and to retain what we have now, depends on how well we can solve these problems.

WB3SMH in "Amat. Newsletter, Sept. '71.



Photograph taken at Vickly Radio Club Narrogin, Western Australia, on 3rd October to mark the visit of the Federal President, Ockley (standing, with glasses). Operating mobile was Percy Beacher, VK3ZD, Vice-President of the VHS Division, who drove Michael around. (Block courtesy "Narrogin Observer")



# NEW CALL SIGNS

## AUGUST 1971

VK1DS—P. A. Smith, 6 Rawell Pl., Weston, 2600.  
 VK1CA—D. W. O. B. Wilson, Youth Hostel, Dryandra St., O'Connor, 2601.  
 VK380—W. F. Noble, 23 Isabel St., Belmore, 2602.  
 VK2HAA—Arimdale Police Citizens' Radio Club, Runden St., Arimdale, 2608.  
 VK2ZTH—T. Tucker, R.M.R. 1983, Lancelot St., Blacktown, 2148.  
 VK3PM—G. S. V. Frew, 13 Wellington St., Middle Brighton, 3188.  
 VK3YV—T. D. K. W. Bradbury, 1 Shrimpton Crt., Box Hill North, 3128.  
 VK3ABM—W. Porter, 1 Heyington Pl., Torrak, 3142.  
 VK3AHC—H. M. Charles, 5/22 Wallace Ave., Torrak, 3142.  
 VK3JU—H. Jupp, 20 Webster St., Dandenong, 3185.  
 VK3BFT—Collingwood Technical College, 35-41 Johnston St., Collingwood, 3066.  
 VK3YCO—S. L. Morgan, 8 Nelson St., Bendigo East, 3600.  
 VK3YGC/T—R. C. Corrigan, 2 Valewood Dr., Mulgrave, 3170.  
 VK3ZHC—J. R. Mathieson, 3 Cherry Rd., Balwyn, 3103.  
 VK4AD—W. E. Kildun, C/o J. McWhirter, 52 Queens Rd., Clayfield, 4011.  
 VK4SE—S. St. George, 1 Aspect St., Toohey, 4010.  
 VK4WA—A. E. Watkins, 1/21 Laver St., Albion, 4010.  
 VK4ZIL—K. C. Mounsey, 343 Rockonia Rd., North Rockhampton, 4700.  
 VK4UP—R. L. Parnell, 23 Margaret St., Port Augusta, 8709.  
 VK4UQ—J. A. Cooper, 19 Charles St., Norcross, 5061.  
 VK3ZET/T—E. R. Tuohy, 30 Malvern Ave., Malvern, 5061.  
 VK6HN—A. T. G. Hanson, 121 Rosebery St., Inglewood, 5082.  
 VK6NY—R. B. Bertram, Station, Portlaurie, Portlaurie, C/o. Allied Minerals N.L., 283 Rokeby Rd., Subiaco, 8008.  
 VK6RV—G. W. Vaughan, 15 Munyang Way, Morcay, 6082.  
 VK7JU—M. G. Burelligh, 12 Benjamin St., Launceston, 7250.  
 VK6VV/T—E. W. Clarke, P.O. Box 171, Katharine, 7250.  
 VK6ZDH—D. R. Hockley, 2334 Britomart Gardens, Adelaide, 5790.

## ALTERATIONS

VK1ZVT/T—D. S. Thomas, 2/47 Hampton St., Varnulmaria, 3600.  
 VK2BV—Waverley Radio Club, 49 Old Bush Rd., Engadine, 2233.  
 VK2KR—R. C. Maitell, 21 Putarri Ave., St. Ives, 2075.  
 VK2LI—M. P. Moore, 21 Avoes St., Randwick, 2233.  
 VK2AB—A. J. Forbes, 30 Flood St., Bondi, 2033.  
 VK2ABS—R. G. Sullivan, 156 Kilahe Bay Rd., Kilahe Bay, 2233.  
 VK2AN—J. A. Simonsen, 6 Koorabel Ave., West Wollongong, 2500.  
 VK2ANZ—S. Smith, 344 Bacon St., Grafton, 2460.  
 VK2ABU—H. S. King, 39 Coutman St., West Wollongong, 2460.  
 VK2ATZ—Westlakes Radio Club, Anzac Pde., Teralba, 2284.  
 VK2BGV—J. Voron, 60B Dutrieu St., Randwick, 2201.  
 VK2BHU—E. J. Town, 37 Numa Rd., North Ryde, 2113.  
 VK2BTE—T. S. Barnett, Lot C, Mt. Keira Rd., Wiltton, 2571.  
 VK2CAS—A. G. Syvonen (Sgt. Ldr.), Lot 1, 2555 Main Rd., North Springwood, 2777.  
 VK2ZFT/T—R. F. W. Boundy, Lot 20, Hickey St., Ballina, 2478.  
 VK3ZY—A. E. Kent, Lot 358, Thirroul Rd., Karahunda, 2533.  
 VK3ZHE—H. D. Lundell, 10 Tyren St., Chatswood, 2067.  
 VK2ZHM—T. Mitchell, Lot 259, Baunister Head Rd., Moolymook, 2539.  
 VK3ZTP—R. H. Smith, 188 Pacific H'way, St. Leonards, 2055.  
 VK3ZIZ—H. P. Robinson, 8/18A Meadow Cres., Meadowbank, 2114.  
 VK3ZUT/T—R. Eccleston, Addition of T. VK3ZUT, 1/44 48 Durrant St., Nth. Brighton, 3109.  
 VK3VR—D. H. Sinclair, 9/42 Clark St., Port Melbourne, 3207.  
 VK3YP—W. H. Payne, 3 Harrow Crt., Doncaster, 3108.

VK3ADG—J. A. G. Miller, 554 Malvern Rd., Prahran, 3181.  
 VK3AGT/T—G. Willey, Station Upper Mt. Morton Rd., Belgrave Heights, 3160.  
 VK3ABR—R. A. Boucher, 11A Hall St., Moonee Ponds, 3039.  
 VK3BBI—R. Lukes (name amended), 43 Pennell Ave., St. Albans, 3021.  
 VK3YDT/T—J. W. Whitehead, Addition of T. VK3ZAU—J. J. Zmood, 1 Wrixon Ave., East Brunswick, 3187.  
 VK3ZJY—R. H. Ely, 12/37 Ewart St., Malvern, 3164.  
 VK3ZKO/T—J. R. Broughton, Addition of T. VK3ZLS—G. R. Forman, 8 Comrie Crt., Baywater, 3153.  
 VK3ZOG—P. G. M. Bruer, 21/48 Walsh St., South Yarra, 3141.  
 VK3ZSN/T—W. Chandler, Addition of T. VK3ZKA—D. Mitchell, 17/48 Lansell Rd., Too-rak, 3143.  
 VK3ZIH/T—R. S. Herman, Addition of T. VK3ZPA/T—P. A. Wolfenden, Addition of T. VK4OP—K. P. P. O'Farrell, 37 Amsterdam St., Upper Mt. Gravatt, 4122.  
 VK4ZDS—D. Morris, 4/34 Morhead St., Bundaberg, 4676.  
 VK5QA—F. T. Wilson, 1 Perseus Ave., Ken-burn, 5100.  
 VK5XG—G. N. Antuar, 16 Pine St., Peterborough, 5422.  
 VK5ZCB—T. R. Friebe, 145 North St., Henley Beach, 5022.  
 VK5ZPR—P. R. Banks, 3 Park Tce., Enfield, 5085.  
 VK6BQ—R. R. C. Davies, Lot 10, Kewina Rd., Hickley, 6075.  
 VK6NF—N. F. Odgers, 18 Fernell Pde., Bassendene, 6094.  
 VK6NH—H. Hyde, 57 Hennessy Ave., Orelia, 6167.  
 VK6ZV—F. K. Lawlor, 13 Belairs Rd., Kar-chin, 6105.  
 VK6ZCE—C. Moray, 3 Clarendon St., Colling-wood, 8011.  
 VK6ZPH—C. F. Fufner, Station, "Marcebe", Albany, 8100.  
 VK6ZG—G. R. Gaiger, 28 McGill St., Kewdale, 6105.  
 VK7ZAE—A. R. Everts, 17 Gregory St., Sandy Bay, 7100.  
 VK7ZLH—R. L. Hilbert, 647 Huon Rd., Fern Tree, 7101.  
 VK7ZMS—J. Nuttard, 57 West Park Cr., Burnie, 7320.  
 VK8DO—D. O. White, 32 Mullen Gardens, Alawa, 6790.  
 VK8AD—R. Devereux, P.O. Box 846, Rahang, N.G.  
 VK8BJ—B. J. Mennia, P.O. Box 706, Madang, N.G.  
 VK8VM—C. Fisher, P.O. Box 428, Port Moresby, P.

## CANCELLATIONS

VK3AS—A. C. Freeman, Deceased.  
 VK3CUL/T—L. E. Taylor, Not renewed.  
 VK3DU—D. R. W. Fullerton, Not renewed.  
 VK3EF—J. P. Small, Deceased.  
 VK3JZ—S. Blather, Deceased.  
 VK3NY—J. J. Berry, Not renewed.  
 VK3QP—L. W. Hughes, Deceased.  
 VK3YE—J. C. Cramer, Not renewed.  
 VK3WS—R. N. Gooden, Deceased.  
 VK3YV—G. T. Littlefair, Deceased.  
 VK3ZAF—J. E. Johnson, Deceased.  
 VK3ZAG—A. O. Brand, Not renewed.  
 VK3ZAG—L. D. Sanders, Not renewed.  
 VK3ZBK—W. F. Porter, Deceased.  
 VK3ZBA—H. Scholins, Not renewed.  
 VK3ZBD—A. H. Bennett, Not renewed.  
 VK3ZBF—P. B. Crum, Not renewed.  
 VK3ZBP—G. Williams, Transferred to Qld.  
 VK3ZEE—R. J. Jarrell, Not renewed.  
 VK3JK—G. S. V. Frew, Now VK3PM.  
 VK3JAI—E. W. Cleburne, Transferred to N.S.W.  
 VK3AYC—Cullfield Grammar School, Not renewed.  
 VK3BDR/T—D. K. W. Bradbury, Now VK3SVY/T.  
 VK3ZED—J. Edwards, Not renewed.  
 VK3ZPV—R. J. Gowland, Not renewed.  
 VK4HF—V. F. Davidson, Not renewed.  
 VK4CM/T—T. M. B. Elliott, Not renewed.  
 VK4MK—M. T. K. Fryer, Not renewed.  
 VK4PZ—Padua College Radio Club, Not renewed.  
 VK4WH—W. E. Hagarty, Not renewed.  
 VK5ZJ—J. G. H. Rowell, Not renewed.  
 VK5EA—Brompton Boys' Radio Club, Not renewed.  
 VK5HU—K. L. Gillon, Not renewed.  
 VK5MV—H. Winkler (Rev.), Not renewed.  
 VK5PD—J. H. Boucaut, Not renewed.  
 VK5WZ—P. G. Anear, Deceased.  
 VK5YC—K. C. Young, Not renewed.

VK5ZCL—P. T. Leather, Not renewed.  
 VK5ZKE—D. P. Ramsey, Transferred to Vic.  
 VK5SE—H. D. Spencer, Not renewed.  
 VK7ZWD—D. Whent, Not renewed.  
 VK8JC—J. A. Cooper, Now VK5UQ.  
 VK9LM—L. G. Meek, Transferred to N.S.W.  
 VK9WB—W. A. Bowles, Not renewed.

## LICENSED AMATEURS IN VK

AUGUST 1971

	Full	Lm	Total
VK0	11	1	12
VK1	88	30	118
VK2	1419	498	1917
VK3	1300	609	1909
VK4	320	204	524
VK5	515	288	803
VK6	369	125	494
VK7	156	35	191
VK8	37	18	55
VK9	84	11	95
	4507	1883	6390
			Grand Total

## THE MORSE CODE MADE EASY

An album of three Records produced with Ivan R. Hodder by The Flight Training Centre (Aust.) Pty. Ltd. Revolutionises the learning of Morse Code—all you need is the family Record Player!

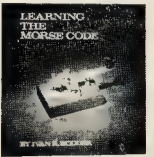
The F.T.C. books has cleared the old, now outmoded system of learning the Morse Code by visual means alone. Those learning the Code by this method rarely progressed beyond five words per minute. This course is designed to teach aural recognition of the symbols—as the student will hear them in actual life.

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## SILENT KEYS

It is with deep regret that we record the passing of—

VK2DQ—D. Nourse  
VK2BKW—A. J. Wrigglesworth  
WIA-L3031—F. G. Flounders

## RECIPROCAL STATION

The following is extracted from I.A.R.U. Region 1 News—

The President,  
Radio Society of East Africa,  
P.O. Box 5581, Nairobi.

Dear Sir,

1. It would be very much appreciated if you could give the widest publicity possible in all the Amateur Radio magazines to the fact that all visitors to East Africa who are desirous of obtaining an East African call sign whilst on holiday should apply in writing in the first instance to—

Engineer-in-Chief,  
S.A. Posts and Telecomm. Corp.,  
P.O. Box 7129,  
Kampala,  
Uganda

(For attention: "R.C. Section")

and should be prepared to submit a photograph of their current licence together with proof of a pass in a Morse test at 12 words per minute, or more. The application should be submitted at least three months before the intended visit, in order that the necessary clearance can be obtained from the respective Governments and should be accompanied by letters from two referees testifying the applicant's good character and interest in Amateur Radio.

2. Upon receipt of the application in this office the necessary machinery will be set in motion. No guarantee of success of the application can be given, but every one received is dealt with equally.

3. It would also be appreciated if you could bring to the notice of all your members the contents of Clause 14 of the Amateur Radio Licence (E.A.) which states: "This Licence shall be returned to the Director-General when it has expired or been revoked." This applies also to licensed Amateurs who have left East Africa permanently.

Thank you for your anticipated help and co-operation.

Yours faithfully,  
(Signed) A. F. Ward,  
for Engineer-in-Chief.

## WIRELESS INSTITUTE OF AUST. VICTORIAN DIVISION

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Secretary, Vic. Div., W.I.A.,  
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## OVERSEAS MAGAZINE INDEX

(1) "Break-In" Sept. Turn on that transistor. Designing an equalised pre-amplifier for stereo magnetic cartridges; Microwaves for the Amateur; Interesting facts for the s.h.f. man.

Articles which appear in other magazines are as follows:

**Antennas:** (3) R.F. Power Measurement with Hot-Carrier Diode; IC/Photoelec. Compressor; AGC Unit; The Theft Stopper; Yet Another Code Monitor; The Spider, a gadget for the transmitter man with a following linear amp.; An IC Pulser for the Amateur Experimenter; A DC Isolator for Phones; (5) EK System using Reed Relays; (7) Another Transistor Tester; A General Purpose Solid State Pre-Amplifier; (8) FET Transconductance Tester.

**Antennas:** (4) Adjusting the Cubical Quad for Optimum Results; (5) Basics About Antennae, notes on the end fed and tuned doublet types; (8) 20 Metre Vertical Antenna.

**General:** (2) You can take it with you; Four Tube Station (c.w. on 40 and 80); Ali's Wail in Amateur Radio; (3) Transistorised Power Supplies; A Marketing Man's Approach to Ham Radio; (4) Mod-Med Interference, Its Causes and Cures; New Hope for Learning the Code; (7) Semiconductor Curve Tracer, Part 2; (7) S-X-pedition to the Lacedives; Facsimile for the Radio Amateur, Part 1; Diary of DX-pedition; (3) Facsimile for the Radio Amateur, Part 2; (4) Highveld goes to the lowveld; The Road of Africa Rally; (7) Low Loss Passive Bandpass C.W. Filters; Review, Drake Marker Luxury P.M. Transceiver; (8) Photofabrication of PCB's; RTTY Automatic Frequency Control; IC Phase Locked Loops.

## HAMADS

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Extra words, 3 cents each

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**FOR SALE:** A.W.A. MR20B 3-channel FM Transceiver complete with control box and Channel A or B crystals, \$50, E. Penkiss, 8/11 Northbourne Place, Canberra City, A.C.T., 2601

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**FOR SALE:** FTD1X10, FLDX200, Heathkit SB16 Monitor, small Oscilloscope, heavy duty Rotator, Hy-Gain Quad, Heathkit Catech, co-ax and fittings (incl. 30 yds. new RG14), etc., etc. Leaving VK so am open to offers. Phone 723-2645 (Melb.) after 6 p.m.

**FOR SALE:** Conset 2 m/s SSB/AM/CW Transceiver, 15 MHz. Coverage, transistors, receiver, manually transistorised transmitter with 6300 final. With 240 volt power supply and manual, \$150. 24 Seaford Ave., Kingswood, S.A. Tel. 71-4671.

**FOR SALE:** to those who know the breed. Collins Communication Receivers R350A and R391. 500 KHz. to 32 MHz. 1.1 MHz. bands, excellent condition. Price \$1100 each. Details on request. VK3IZ, Phone 488-5750 (Melb.).

**FOR SALE:** Two Pve Mx. 1. Transceivers (modified 5 metres AM tunable, 12 volt units, all control w.t. xtal included, repainted grey, \$20 each. T.C.A. 1574 Transceiver (2 channel mod, 2 FM), 10 watt output, rocking armature mikes, needs AG power supply, circuit included, fern, all parts, repainted grey, Ch. B state included, \$55. Write K. Brady, VK2AFP, 24 Searlelan Ave., Dapto, N.S.W., 2530.

**FOR SALE:** Yaesu FTD4000 Transceiver. This unit has had little use and is in as new condition. Excellent performer on all bands, \$400. VK3ZK, 52 Arthur St., Plympton Pk., S.A. 3038. Ph. 93-1523.

**Receiving:** (2) 15 Metre Signals from Jupiter; DX from the Stars; (7) 80-10 Metre FET Pre-Selector; 2 x MPF102s in a Cascade Circuit; Build a Solid State L.F. System; Update that old Receiver for SSB, etc.

**Transmitting:** (2) Tiny Tim Linear Amplifier, 600w., 2 x 811A and an old t.v. transformer; Digital Readout for Your VFO; (3) Build a Solid State Catech; 200 KHz. Modulated Stable VFO with tracking mixer (use it in tx or rx applications); (4) An AM Final for your Transmitter; (5) Build up of a Transmitter; Layout of a Transmitter; A Wideband Construction Techniques for Linear Amplifiers.

**VHF:** (3) Multi-Channel Operation with the Motorola HT200; (5) Waveometer for VHF; (6) A Element Yagi Antenna for 20Cm.; A 23 Cm. Converter with Hot-Carrier Diode Mixer; Interdigital Bandpass filter for 23 Cm. A Ground Station for Satellite Comm. via Oscar 8; Basic Digital Circuits; A Wideband Pre-Amp. for Freq. Counters to 80 MHz.; A Four Digit Freq. Counter Module for Freq. up to 50 MHz.; A New Method of Freq. Multiplication for VHF and UHF SSB; A Transistorised Power Amp. for 8 MHz using the 2N3632; AM Demodulators using Silicon Semiconductors; A Low Cost Home-Built 100 KHz. Oscillator Using the Motorola TU110 series; Transmitter on 430 MHz. (4) Freq. Syn. for VHF Scatter; (5) Scattering Communications; FM Sequential Encoder; VHF Wave Signal Source.

## KEY

(1) "Break-In", Sept.; (2) "73", August; (3) "73", Sept.; (4) "Radio 23", Sept.; (5) "Short Wave Magazine", Sept.; (6) "VHF Comm.", August; (7) "QST", Sept.; (8) "Ham Radio", Sept. Issues 1971. —VK3ASC.

**FOR SALE:** Yaesu FR50 rx with spkr., \$140; Yaesu 6 mx and 2 mx Converters (transistors), \$20 each; F Series SSB Generator board, unused with circuit, \$35; or \$200 the lot. Also Marconi CH700 rx with 500 KHz. antenna and 100 KHz. oscillator. All in good order, SBC. AG operated Pye Transceiver (3/12) with 5/8ths vertical, FET pre-amp., P/S and 8 B and regulator rocks, \$50. National tape Recorder RQ25S, 7 in. reels, \$50. Contact I. O'Leary, VK2ZIO, on Tel. (Syd.) 46-6085 after 5 p.m. Mondays, Tuesdays or Thursdays.

**NATIONAL Tape Recorder RQ158S**, portable, battery operated, with AG Adepter RP-99; 5 in. reels, 2 track, 2 speed, with mike and instruction book; as new, \$50. National Cassette Tape Recorder, latest model RQ205S, battery or AG operated, with mike and instruction book, as new, \$55. VK3LC, All Chandler, Phone 30-355 (Melb.).

**WANTED:** AR7 Receiver with Coil Boxes or AR8 Receiver. Write giving full details and asking price. Graham Douglas, VK3ZIG, P.O. Box 365, Port Augusta, S.A. 5700. Phone 2571.

**WANTED:** AR22 Rotor or Prop. Pitch Motor with Indicator in good working order. Contact J. Gravins, 38 Robinson St., Moorooka, Brisbane, Qld., 4105.

**WANTED:** A.V.A. Green Carbons, type MR104 or MR204, high band, with or without power supply, control unit or valves. Willing to make a deal with a low band set if required. Gordon Reid, 13 Ashton St., Tamora, N.S.W., 2689.

**WANTED:** Band-change motors and L-R indicator drive transformers to suit 24 volt Bendix M28S Transistorised Transmitters. Also needed T16 or A15664. State prices required. Also Vintage radios complete with Horn Speaker, early 1920's, good price paid, send details. O'Brien, Edgar Rd., San Ramon, Vic., 3655. Phone 1040.

**WANTED:** Galaxy 111. with or without power supply. Price and condition to Ray Malcolm, VK3BAO, Botsdale, Vic., 3590.

**WANTED:** Rotary Converter to restore R.A.N. Type S Synchronous Rotary Gap Spark Transmitter. Output 70 w.a.c. at high frequency, probably 500 KHz. Unit will probably have 24 field pipes and can be identified by an electron gun end for driving rotary gap. R. F. Fisher, VK3BAO, 241 Royal Pde., Parkville, Vic., 3052. Phone 340-5331 (business hours).

**WANTED:** Someone to repair and re-align No. 122 Transceiver, preferably someone familiar with the type equipment and are willing to pay the right price for the repairs. Contact York Mendoza on Tel. (Syd.) home 59-4142 or work 59-0401.

**WANTED:** SSB Transceiver with power supply. Must be in good condition. VK2AFP, R. Groom, 7 Keats St., Byron Bay, N.S.W., 2481.

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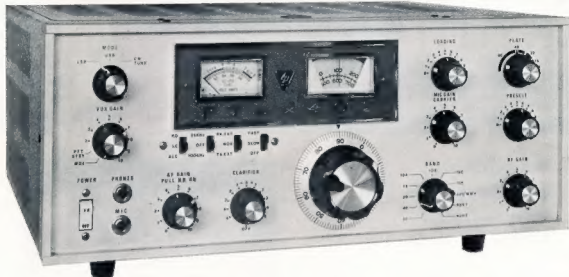
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## NEW DE LUXE TRANSCEIVER *from* YAESU Model FT-DX-401



YAESU offers the all new YAESU FT-DX-401 SSB Transceiver. Considered the best buy in Amateur equipment available today, the FT-DX-401 features high power, super sensitivity, and sharp selectivity. In one complete station package, FTJ microphone is included. Except for a speaker, no other accessories are needed to be "on the air". De Luxe equipment built-in to the FT-DX-401 at no extra cost includes: AC power supply, noise blanker, dual calibrators (100 KHz. and 25 KHz.), VDX, break-in CW with sidetone, 600 Hz. sharp CW filter, clarifier, phone patch terminal, cooling fan, and WWV 10 MHz. band. Full transceive capability 80 through the complete 10 metre band. Two blank auxiliary positions are provided on the bandswitch.

The FT-DX-401 features velvet smooth tuning with zero backlash planetary gear system. Read-out to 300 Hz. is easily obtainable when calibrated to the nearest 25 KHz. marker. WWV frequency check to crystal calibrator assures "on frequency" operation on all bands.

For DX operation a noise blanker is mandatory. . . the FT-DX-401 has it! Complete with signal threshold control, the blanker picks out noise spikes completely and leaves only clean signal copy.

DUAL TOROID first I.F. stage provides high gain/bandwidth product for double conversion circuit used in the FT-DX-401. This system guarantees linear tuning rate plus high image rejection.

Twenty tubes plus fifty silicon semiconductors make up the active devices used in the Transceiver. The passive crystal filters are of the six-pole type designed for optimum SSB audio quality and sharp CW reception.

The FT-DX-401 was planned and designed specifically for the World Amateur. Export quality, with superior components and finish, specially tested, and including hand-fitted FTJ microphone. Spare parts, personalised 90-day warranty, and continuing service available through your authorised dealer.

Check the specifications and compare your cost. We believe that the FT-DX-401 is truly the best buy in the Amateur field today.

### SPECIFICATIONS

Maximum Input Power: 500W. PEP SSB.  
Sensitivity: 0.2 Microvolt for 10 dB. S/N (SSB 14 MHz).  
Selectivity: 2.5 KHz. (60 dB. down), 3.7 KHz. (60 dB. down) for SSB; 600 Hz. crystal filter nominal shape factor 1.8:1 for SSB; 600 Hz. (60 dB. down) 1.2 KHz. (60 dB. down) for CW.  
Frequency Range: 3.5 to 4.7 to 7.5, 10 to 10.5 WWV, 14 to 14.5, 21 to 21.5, 28 to 30 MHz.  
Unwanted Sideband Suppression: 55 dB. down (at 1000 Hz.).  
Carrier Suppression: 50 dB. down from full output.  
Distortion Products: More than 25 dB. down.  
I.F. and Image Ratio: More than 50 dB. down.  
Frequency Stability: Less than 100 Hz. drift in any 30-minute period after warm-up.  
Antenna Impedance: 50 to 120 ohm—SWR 2:1 or less.  
Audio Output: 1.3 watts, 350-2200 Hz. 8/600 ohm impedance.  
Power Source: 117 or 234 volts AC, 50/60 Hz.  
Dimensions: 15 1/4 inch wide, 6 1/4 inch high, 13 1/4 deep.  
Weight: 45 pounds.

**PRICE \$695.00**

Optional Extras: SP-401 Speaker \$28.50  
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YD-844 De Luxe Desk Microphone \$39.

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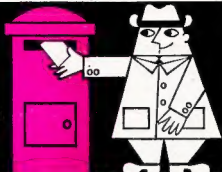
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